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FOR EDITORIAL AND BUSINESS NOTICES, SEE THIRD COVER PAGE

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BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense.

UNDER THE DIRECTION OF

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.

J. R. SCHRAMM, Editor-in-Chief

FREDERICK V. RAND, Associate Editor-in-Chief

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APRIL, 1925

No. 4

ENTRIES 3140-4001

AGRONOMY (CROPS AND SOILS)

C. V. PIPER, *Editor*

MARY R. BURR, *Associate Editor* (Crops)

T. D. RICE, *Associate Editor* (Soils)

(See also in this issue Entries 3307, 3369, 3374, 3391, 3394, 3401, 3408, 3418, 3429, 3438, 3454, 3464, 3559, 3662, 3813, 3845, 3884, 3894, 3982, 3995)

CROP SCIENCE (ARVICULTURE)

3140. ANONYMOUS. An interesting wheat table. *Agric. Gaz. New South Wales* 35: 770. 1924.—Statistics indicate yields of wheat upon new, fallowed, and stubble land at 10.4, 14.1 and 9.6 bushels per acre, respectively.—*L. R. Waldron.*

3141. ANONYMOUS. Artificial drying of crops. *Jour. Ministry Agric. Great Britain* 30: 1128-1130. 3 fig. 1924.—Tests on the practicability of drying different crops in stacks by forcing a current of air through the stack by means of a fan driven at high speed by a motor were conducted on 21 stacks made up of meadow grass, red clover, white clover, rye grass, rye, barley, oats, tares, peas, beans and lucerne.—Peas were dried successfully but much still remains to be known before any really valuable advice can be given to those who are anxious to make a trial of artificial drying.—The investigations are being continued.—*M. B. McKay.*

3142. ANONYMOUS. Verslag van de vergadering der landbouwkundige sectie, opmaandig, 26 Maart 1923. [Report of meeting of the agricultural section, March 26, 1923.] *Arch. Suiker-indust. Nederland-Indië* 31: 293-382. 1923 [1924].—This report contains discussions regarding the following subjects: Planting of sugarcane, including time of planting, delivery, use and germination of bibit (plant material); fertilizing and manuring, including value of fertilizers, phosphate fertilizers; irrigation; influence of weather conditions; conditions of the plantation; influence of flowering (arrowing) on the product; diseases including sieve tube disease, stripe or mosaic disease, rootrot, and white woolly aphid (*Oregma lanigera*); growth, length and stooling of cane; lodging of cane; the taking of samples for testing; division of varieties in the field and the plan of planting; experiments; bibit culture; and costs of planting.—*Peter J. Klaphaak.*

3143. ADAMS, J. Does light determine the date of heading out in winter wheat and winter rye? *Amer. Jour. Bot.* 11: 535-539. 1924.—Winter wheat and winter rye were grown in a greenhouse and a portion of the plants illuminated by electricity at night. The ones thus

treated headed out from 4 to 6 weeks earlier than those exposed to daylight only. In order to determine whether a similar result could be secured by sowing the seed at different dates, seed of both species were planted in a greenhouse at Ottawa at intervals of about a week from March 5 to April 23. The resulting plants were set out in the open ground as soon as the weather became suitable. For comparison, one row of each was also sown in open ground April 30. The plants sown first headed out the same season but those from the last sowings and those in the open ground did not. Evidently both winter wheat and winter rye require a longer growing season than spring varieties of the same species, and the growing season at Ottawa is not long enough for heading out if plants are sown in the open ground in spring. Both light and heat are important in determining the time of heading out, both factors being of approximately equal importance and to a certain extent interchangeable.—*E. W. Sinnott.*

3144. ALLEN, E. W. *The method of science in agriculture.* Science 55: 6-11. 1922.—This address was delivered at the meeting of the American Association for the Advancement of Science at Toronto, 1921, by the Vice-president and Chairman of Section O, Agriculture.—*Mary R. Burr.*

3145. ARNY, A. C., AND C. S. DORCHESTER. *Methods of making determinations and interpreting results in grain grading.* Jour. Amer. Soc. Agron. 16: 488-506. 1924.—Unequal division of the original sample by some Boerner samplers does not affect the grade of the grain unequally divided. Taking samples for multiple determinations from different halves or fourths of the original sample has no advantages, as far as accuracy is concerned, over taking contiguous samples of the same size or one sample of the same size as the total of the smaller ones. Indications are that samples for percentage determinations, 100 gm. in size give significantly greater accuracy than samples of smaller size. To eliminate chance as far as possible in the grading of grain, a system of tolerances is proposed for heat damage and foreign material, based on the variability secured from determinations, on a considerable number of samples of various weights, taken from wheat containing approximately the grade limits of damage or of foreign material other than cereal grains. By the use of tolerance percentages a more equitable grading is possible than where no tolerance is used in connection with the grading of wheat near the grade limits.—*F. M. Schertz.*

3146. BEATTIE, J. H. *Greenhouse crops adapted to alkaline or neutral muck soils.* Jour. Amer. Peat Soc. 17: 23-27. 1924.—This is a treatise on the adaptability of muck in place of manure for the growing of crops in the greenhouse. Included is a brief history of greenhouse development and the need of a substitute for stable manure. Mixtures of $\frac{1}{4}$ muck to $\frac{3}{4}$ soil by volume have given as high yields of roses, cauliflower and lettuce, as soils containing large amounts of stable manure. Care should be taken that the muck is of suitable quality.—*E. A. Hollowell.*

3147. BECKER, J. A., L. B. FLOHR, G. B. L. ARNER, W. F. CALLANDER, AND O. A. JUVE.. *Agricultural statistics.* U. S. Dept. Agric. Yearbook 1923: 601-878. 1924.—Detailed statistical tables of the cereals, fruits, vegetables, and other crops are given for 1923.—*C. J. Shirk.*

3148. BERKNER. *Die Kartoffelpflanzgutenerkennung unter besonderer Berücksichtigung der Herkunft.* [Potato seed certification with special reference to the origin.] Mitteil. Deutsch. Landw. Ges. 39: 869-872. 1924.—The ecological factors influencing the development of healthy potato tubers and the relation of this to certification are discussed.—*A. J. Pieters.*

3149. BLAKELY, W. F. *Weeds of New South Wales.* Agric. Gaz. New South Wales 35: 786-788. 1 fig. 1924.—Field bindweed (*Convolvulus arvensis*) is described and methods are given for eradication and control. It was first recorded in New South Wales in 1898.—*L. R. Waldron.*

3150. BOLTZ, W. *Wie sind Saftreiche Futterstoffe mit den geringsten Nährstoffverlusten einzusäuern?* [How can sappy fodder be ensiled with the least loss of nutrients?] Mitteil. Deutsch. Landw. Ges. 38: 527-529. 1923.—The author replies to Meyer who had criticised an earlier work of Boltz on the ground that the small silos used by Boltz did not permit of as great losses as larger silos. In the present paper Boltz points out that in Meyer's experiments the grass and clover were not cut and were not firmly pressed down. Hence, there was a rise of temperature with attendant loss of organic matter. Quoting from an earlier paper by Boltz and Dietrich, he shows that loose packing results in much greater losses of

organic substances, crude protein, digestable nutrients, and feeding value than firm packing.
—A. J. Pieters.

3151. BÖMER, A., UND H. MATTIS. Über hohe Solaniningehalte bei Kartoffeln. Vorläufige Mitteilung. [High solanin-content in potatoes. Preliminary paper.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 45: 288-291. 1923.—Several instances are reported of potatoes [*Solanum tuberosum*] harvested in 1922, which were bitter and inedible because of high solanin content. A new method of solanin determination is described, which gives a higher result than those of Schmiedeberg and Mayer and v. Morgenstern. Solanin content of samples of these bitter potatoes ranged from 25.3 to 57.8 mg. per 100 gm. as compared with 2.0-7.5 mg. for normal potatoes. Samples of these high-yielding potatoes, with normal checks, have been planted for future investigation as to the cause of high solanin-content.—E. E. Stanford.

3152. BRANDES, E. W., C. O. TOWNSEND, P. A. YODER, S. F. SHERWOOD, R. S. WASHBURN, G. B. L. ARNER, O. E. BAKER, F. C. STEVENS, F. H. CHITTENDEN, AND C. F. LANGWORTHY. Sugar. U. S. Dept. Agric. Yearbook 1923: 151-228. 51 fig. 1924.—The relatively high energy value compared with costs makes sugar an important food. The sugar cane and the sugar beet industries in the United States are discussed in all aspects. Such factors as climate, soil, drainage and water supply, the agricultural practices and the labor requirements, the diseases and insect pests, and the manufacture of sugar from sugar cane and sugar beet are presented in detail. World production, consumption, and movement of sugar seem to indicate that the outlook for the future of the industry is economic rather than agronomic.
—C. J. Shirk.

3153. BREAKWELL, E. The grasses and fodder plants of New South Wales. 370 p. Fig. 183. Dept. Agric. New South Wales: Sydney, 1923.—This work is a comprehensive presentation of the present knowledge of forage plants in New South Wales. Part 1 deals with the grasses, and after a discussion of such broad features as palatability, seed mixtures, seed, sowing, pastures and their treatment, each important species both native and introduced is treated and in most cases illustrated. Part 2 deals with the legumes, the soybeans, the saltbushes and miscellaneous plants of forage value, including trees. The book is a convenient and authoritative text valuable to every one interested in the subject.—C. V. Piper.

3154. BREDEMANN, G. Die Bestimmung des Brandsporengehaltes von Weizenproben. [Determination of smut-spore content of wheat samples.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 45: 208-209. 1923.—The article is mainly a reply to and counter criticisms of criticisms of the method by RIEHM, Mitteil. Biolog. Reichsanstalt Land- u. Forstwirtschaft 16: 45. 1921. Five to ten mg. of the pulverized sample are weighed and heated on a slide with a chloral-hydrate-glycerin-HCl solution until the starch is dissolved and the brad particles are transparent. The smut-spores (*Tilletia tritici* or *T. laevis*) are counted with the microscope. Calculations are based on the determination that 1 mg. of spores of either species, dried at 100°, contains 450,000 spores.—E. E. Stanford.

3155. BRIOUX, CH. Saturation dans le sol de l'acide sulfurique utilisé pour la destruction des mauvaises herbes. [The saturation of the soil with sulphuric acid used in the destruction of weeds.] Compt. Rend. Acad. Sci. Paris 179: 74-77. 1924.—These different soils were studied: those made alkaline with 3.8% calcium carbonate; those to which 1.7% calcium carbonate was added and an acid soil. After adding 10-12% sulphuric acid, the hydrogen-ion concentration was determined. It was found that if calcium carbonate is present the acid is rapidly neutralized. It is thus only in acid soils that it becomes harmful.—C. H. Farr.

3156. CREERY, CHARLES. Swede and turnip seed growing in Kent. Jour. Ministry Agric. Great Britain 30: 1139-1142. 1924.—The methods of growing, harvesting and threshing are described for turnip and swede seed in Kent where a large acreage is grown.—M. B. McKay.

3157. CUNDY, A. T. Wyoming forage plants and their chemical composition. Studies no. 6. Wyoming Agric. Exp. Sta. Bull. 137. 3-16. 1924.—*Deschampsia*, timothy, redtop, wire grass, wheat grass, cord grass, brome grass, and sedge were studied in relation to their chemical composition. These forage plants were found to be less valuable as hay when cut unduly late in the season. The introduced grasses, timothy and redtop, lose value

most rapidly with the advance of the season, and wire grass and sedge suffer the least damage from late cutting.—*E. B. Payson.*

3158. EDMUNDSON, W. C. Seed potato improvement. *Agric. Jour.* [British Columbia] 8: 272-273. 1923.—This emphasizes the difference in yield of different strains of the same variety and the desirability of obtaining stock from heavy yielding strains.—*J. W. Eastham.*

3159. ENGBRETSON, ALBERT E., AND GEORGE R. HYSLOP. Forage crops for Oregon coast counties. *Oregon Agric. Exp. Sta. Bull.* 203. 1-32. Fig. 1-5. 1924.—The main agricultural industry of this coast country is dairying. In order to keep dairy production on a high plane, more legume hay, better pastures, and more succulent crops must be provided. Choice of these crops depends on climate, soil type, and manures or fertilizers available.—The best vetches for spring planting are common, Hungarian, and woolly-podded, sown with oats. Spring planted peas and oats are probably the best annual combination. Red and alsike clovers are excellent hay crops. Gray winter oats is a good grain hay.—Root crops include turnips, mangels, and rutabagas.—Green feed or soiling crops are necessary to supplement summer pasture.—For silage, corn, peas-and-oats, and vetch-and-oats are used.—*C. E. Owens.*

3160. FENTON, E. WYLLIE. Some unusual weeds. *Jour. Ministry Agric.* Great Britain 30: 871-872. 1923.—Brief notes are given on habits and control of the following unusual weeds in Britain: small rough or beaked hawk's beard (*Crepis taraxacifolia*), larger hawk's beard (*Crepis biennis*), goat's beard (*Tragopogon pratensis*), and Mayweed (*Matricaria discoidea*).—*M. B. McKay.*

3161. GAUSSEN, H. Améliorations pastorales et prairies de montagne. [Improvements in mountain pastures and meadows.] *Bull. Soc. Hist. Nat. Toulouse* 50: 299-331. 1922.—The necessity for increasing the production of forage and improving the grazing land in the mountains is indicated because of the importance of this region in cattle raising. Close grazing affects the growth of the forests which is likewise of great economic importance. A detailed study of the action of fertilizers on several mowing meadows was made. Several fertilizers were used in varying amounts and applied at different seasons. Results are fully tabulated, including a study of the floral composition of the meadows. A similar study was made of the effect of fertilizers on the mountain pastures. The effect of clearing off brush is summarized.—*Neil Hotchkiss.*

3162. GRAY, L. C., O. E. BAKER, F. J. MARSCHNER, B. O. WEITZ, W. R. CHAPLINE, WARD SHEPARD, AND RAPHAEL ZON. The utilization of our land for crops, pasture, and forests. *U. S. Dept. Agric. Yearbook* 1923: 415-506. 58 fig. 1924.—Attention is directed to the present situation and the future outlook in regard to the resources available for growing the food and raw materials that must be supplied by crop lands, pastures, and forests. A summary of the present land resources, the extent and character of their present uses, and an estimate of future requirements and the relation of these requirements to the potential area available, is given. Land classification essential to its systematic selection for crop, pasture, and forest is necessary. Agricultural expansion has been and is misdirected and overdone. There is dire need of systematic direction under a national land policy.—*C. J. Shirk.*

3163. GRIEBEL, C. Solaninreiche gesundheitsschädliche Kartoffeln. [Potatoes injurious to health because of high solanin content.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 45: 175-183. 1923.—The history of solanin-poisoning from potatoes [*Solanum tuberosum*] is reviewed. Such poisoning has usually occurred in the summer months, and has been usually attributed to the consumption of new or green or old and much sprouted potatoes. Analyses have showed solanin content of peelings to be higher than that of pulp. Two recent outbreaks of potato-poisoning are particularly discussed. These took place in December, from recently harvested potatoes of 2 different lots from different regions, and are said to be the first reported poisonings at that season. Solanin content in one case reached 0.79%, the highest yet recorded in healthy potatoes. The cause of this high content is unknown unless it may be exposure of the potatoes to light, which previous reports have indicated as augmenting solanin content.—*E. E. Stanford.*

3164. HANSEN, J., AND W. DIETRICH. Stärkegewinnung aus Kartoffeln ohne Verlust an Nährstoffen. [The production of starch from potatoes without the loss of food material.]

Mitteil. Deutsch. Landw. Ges. 39: 352-356. 2 fig. 1924.—A machine for extraction of starch from potatoes is described with an account of various tests showing that by the method used the protein is retained in the product.—A. J. Pieters.

3165. H[ARREVELD], J. v[AN]. Het Ubariet. [Uba cane.] Arch. Suikerindust. Nederland.-Indië 32: 759-761. 1924.—This is a discussion of Bull. 28 of the Porto Rico Insular Exp. Sta., by F. A. LOPEZ DOMINGUEZ.—Coming from North-India or South China, this cane was imported into Argentine by way of Brazil and Mauritius.—Whether it is the same as Kavengire is not certain. This variety was again imported in 1916 for the Exp. Sta. in Java, but it has no importance.—It is good for Natal, Africa, since it is resistant to night frost.—Peter J. Klapaak.

3166. H[ILGENDORF], F. W. A variety trial of mangels. Canterbury [New Zealand] Agric. Coll. Mag. 4: 936-937. 1923.—Yield and dry matter determinations are given for a number of varieties.—H. H. Allan.

3167. HILGENDORF, F. W. Californian thistles and cultivation. Canterbury [New Zealand] Agric. Coll. Mag. 4: 789-790. 1921.—A patch of Californian thistle (*Cirsium arvense*) that had persisted for 25 years under a system of occasional salting, grubbing and irregular cultivation, was completely eradicated in a single season by fortnightly grubbing.—H. H. Allan.

3168. H[ILGENDORF], F. W. Feeding trials with oats. Canterbury [New Zealand] Agric. Coll. Mag. 4: 915-917. 1923.—From experiments with a number of varieties it is deduced that the oat content of chaff is not the sole determiner of its palatability, and that discolored, musty smelling chaff is sometimes preferred by horses to bright clean samples.—H. H. Allan.

3169. H[ILGENDORF], F. W. Filling of wheat in the stook. Canterbury [New Zealand] Agric. Coll. Mag. 4: 922. 1923.—Experimental evidence is given supporting the contention that if there is cool weather while wheat is in the stook the grain will fill better than if it is exposed to dry, hot weather.—H. H. Allan.

3170. HILGENDORF, F. W. Selection of potatoes. Canterbury [New Zealand] Agric. Coll. Mag. 4: 707-709. 1920.—Selection by tubers can be efficacious only when different strains are available for material. The smaller tubers from the most prolific plants should be chosen.—H. H. Allan.

3171. HILGENDORF, F. W. Wheat selection results. Canterbury [New Zealand] Agric. Coll. Mag. 4: 559-560. 1918.—The strains, College Solid Straw Tuscan, College Purple Straw Tuscan, and College Pearl, have given consistently higher yields than commercial samples. Morphological details are given.—H. H. Allan.

3172. HUNTER, HERBERT. Oats: their varieties and characteristics, a practical handbook for farmers, seedsmen, and students. 128 p. 18 fig. Ernest Benn, Ltd.: London, 1924.—This is a handbook on the origin, botanical characters, classification and description of species and varieties of oats. Chapters on the chemical composition of the oat grain, seed selection, and the production of pure seed also are included. This little treatise is intended primarily for use in identifying and discriminating between the many varieties of oats now in general use.—T. R. Stanton.

3173. KRAMER, F. *Salvia occidentalis* Swartz., een goede bodembedekker. [*Salvia occidentalis* Swartz., a good soil-protector.] (With summary in English.) Tectona 16: 47-56. Fig. 2-5. 1923.—*Salvia occidentalis*, which was introduced from the West Indies and spread in a few years over many parts of eastern Java, is successfully used as a soil protector at the Gadoengan experimental plantations in eastern Java. A botanical description is given and the principal qualities are discussed.—Charles Coster.

3174. KUYPER, J. Onderzoekingskenmerken voor de rietsoorten 2727 en 2753 P. O. J. [Characters for differentiation of sugarcane varieties 2727 P.O.J. and 2753 P.O.J.] Arch. Suikerindust. Nederland.-Indië 32: 1025-1026. 1924.—This article contains a discussion of P.O.J. 2727 and P.O.J. 2753, which are repeatedly reported as being mixed. Their similarities and differences are mentioned both for young and mature plants. Other varieties often found as mixtures in new lots of "bibit" are: 2725 P.O.J. and 2747 P.O.J.—Advice is given to obtain a few stalks for determination before buying new "bibit."—Peter J. Klapaak.

3175. KUYPER, J. Verslag over Juli 1924 omtrent het proefstation voor de Java-Suiker-

industrie. [Report for July 1924, Experiment Station of the Java Sugar Industry.] Arch. Suikerindust. Nederland.-Indië 32: 877-879. 1914.—This article contains information regarding work done at the station during the month of July, when 2600 individuals chosen from 45,000 seedlings from the sowing of 1923 were analyzed. Of these analyzed canes, 308 were marked for extended planting; 19 of them are to be rapidly increased by the special "cut-off" method. It was noticed in this year's seedlings that new and better varieties are obtained from the slow improvement of the canes with Kassoer and Chunnée blood.—A list is given of other investigations and analyses.—*Peter J. Klaphaak*.

3176. LANE, THOMAS W. Growing turnip, swede and mangold seed in the Holland division of Lincolnshire and adjoining districts. Jour. Ministry Agric. Great Britain 30: 353-360. 1923.—While there appear to be no statistics available on the acreage of root crops grown for seed production in Lincolnshire, the acreage according to the author is known to be rather large. The natural conditions there especially favor the production of seed of turnips, swedes and mangolds and, to a lesser degree, of cabbage and brown and white mustard. A detailed description is given of the cultural methods used in growing the seed of turnips, swedes and mangolds, and brief mention is made of the insect and other pests that affect these plants.—*R. A. Oakley*.

3177. LOCHNER. Luzernebau und Luzernesamengewinnung in Unterfranken. [Lucerne culture and lucern seed production in Unterfranken.] Mitteil. Deutsch. Landw. Ges. 39: 901-906. 1924.—Lucerne culture is especially important in Unterfranken because of the shortage of pasture. While in Germany as a whole but 0.7% of the arable land is in lucerne, for Unterfranken this figure is 8%. Lucern culture was introduced in 1724. Notes on the history and agronomic data are given. Breeding was actively taken up in 1909 and is directed toward yield and hardness. The seed produced in Franken (Altfrankish) contains much hard seed, especially when harvested in a dry year. Three to 4 cuttings are made and fields remain for 6 to 10 years. The best seed production is found on the mussel chalk soils of the vineyard region. Sandy soils are next in value, while the heavy soils yield a good seed crop only in dry years.—*A. J. Pieters*.

3178. LOHR, P. L. Het verband tusschen uitstoeling en rietproduct. [The relation between stooling and cane yield.] Arch. Suikerindust. Nederland.-Indië 32: 767-773. 1924.—The author, in opposition to STRÜBEN (Ibid. 1911, p. 494), finds that with an increase in stooling, a fairly definite increase can be noted in cane yield per "bouw."—He finds also that by an increase in stooling a slight decrease in weight per stalk is to be found. His final conclusion is that with increase in stooling the cane yield increases; the influence of stooling in a certain plantation and with a single variety is of importance on the cane-yield of that plantation. Tables are given.—*Peter J. Klaphaak*.

3179. McCauley, C. Inverell maize-growing contest, 1923-24. Agric. Gaz. New South Wales 15: 776. 1924.—Seed from 21 competitors was grown upon 1 farm. The maximum yield of 37 bushels was from the variety Hogan.—*L. R. Waldron*.

3180. McMEANS, A. The seed outlook in British Columbia. Agric. Jour. [British Columbia] 8: 248-249. 1923.—This article deals briefly with the possibilities of seed growing in the province.—*J. W. Eastham*.

3181. MANTEL, WILHELM. [Rev. of: SPANN, JOSEF. Alpwirtschaft. (Management of alpine pastures.) F. P. Datterer & Co.: Freising, 1923.] Forstwiss. Centralbl. 46: 268-270. 1924.

3182. MARANIS, A. D. Die Bestimmung der Rohfaser in Kakao und Cerealien. [Estimation of crude fiber in cacao and cereals.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 45: 212-216. 1923.—This is mainly of chemical interest.—*E. E. Stanford*.

3183. MUNRO, J. B. Kale and rape crops. British Columbia Dept. Agric. Soil & Crop. Div. Circ. 3. 1-7. 1 fig. 1924.—This is a discussion of the adaptation, production and utilization of thousand headed kale, dwarf essex rape and agricultural mustard in British Columbia.—*E. A. Hollowell*.

3184. NOLTE, O. Das Wirkungsgesetz der Wachstumsfaktoren. [The law of growth factors.] Mitteil. Deutsch. Landw. Ges. 39: 356-358. 1924.—The author gives figures to controvert the application of the law of growth factors to field results as was done by E. A. Mitscherlich.—*A. J. Pieters*.

3185. NOLTE, O. Versuche zum System Aereboe-Wrangell. [Investigations regarding the [fertilizing] Aereboe-Wrangell system.] Mitteil. Deutsch. Landw. Ges. 39: 862-869. 1924.—Reports are given on an extensive series of trials to test the Aereboe theory that by applying nitrogenous fertilizers to legumes they will be able to utilize the phosphates unavailable to cereals and so render the application of phosphates unnecessary. Alfalfa, peas, clover, Serradella and lupines among legumes and rye, wheat, barley, oats and potatoes were crops under trial.—A. J. Pieters.

3186. OAKLEY, R. A. Important Northern golf grasses. Bull. Green Sec. U. S. Golf Assoc. 4: 290-296. 1924.—The only grasses of importance for golf courses in that portion of the United States lying, broadly speaking, north of the 37th degree of latitude are Kentucky bluegrass (*Poa pratensis*), redbtop (*Agrostis palustris* Hudson), Canada bluegrass (*Poa compressa*), rough-stalked bluegrass (*Poa trivialis*), the bent grasses (*Agrostis* sp.), red or Cheving's fescue (*Festuca rubra*), sheep's fescue (*Festuca ovina*), perennial ryegrass (*Lolium perenne*), and Italian ryegrass (*Lolium multiflorum*). The uses and adaptations of each species are discussed in detail.—L. W. Kephart.

3187. PIPER, C. V. Chaff-head, a dangerous weed. Bull. Green Sec. U. S. Golf Assoc. 4: 284. 1924.—*Achyranthes repens* L., a low-growing, somewhat fleshy perennial of tropical origin has become established at several places in the southern U. S. A. It produces seed in immense numbers and spreads in turf with amazing rapidity. The only known remedy is to dig and burn the plants.—L. W. Kephart.

3188. PIPER, C. V. Grass experiments at Rothamsted, England. [Rev. in part of: BRENCLEY, WINIFRED E. Manuring of grass-land for hay. 146 p. Longmans, Green & Co.: London, 1924. (see Bot. Abs. 13, Entry 5622).] Bull. Green Sec. U. S. Golf Assoc. 4: 101-104. 1924.—The results of the Rothamsted experiments, especially as they pertain to the grasses used on golf courses, are discussed with comment in each case by the reviewer on their applicability to conditions in the U. S. A. The plants discussed include mosses, Rhode Island bent grass, sweet vernal grass, sheep's fescue, velvet grass, Kentucky bluegrass, white clover and weeds. In general the results uphold the methods on golf courses now generally followed in America.—L. W. Kephart.

3189. PIPER, C. V., H. N. VINALL, R. O. OAKLEY, LYMAN CARRIER, O. E. BAKER, J. S. COTTON, O. A. JUVE, NELLIE P. BRADSHAW, E. W. SHEETS, C. D. MARSH, W. C. BARNES, AND W. B. BELL. Our forage resources. U. S. Dept. Agric. Yearbook 1923: 311-413. 80 fig. 1924.—Seven-tenths of the total crop acreage was used to produce harvested forage. Yet this forage constituted a little more than $\frac{1}{2}$ the farm value of all crops. There is a decided correlation between live stock production and that of forage. The production and value of each of the harvested forage crops is presented by maps and tables. The article concludes with a long discussion of the pasturage and grazing problems and conditions in the U. S. A.—C. J. Shirk.

3190. PITT, J. M. Seed maize contests, central coast, 1923-24. Agric. Gaz. New South Wales 35: 789-794. 1924.—This is a general discussion of the seed maize contests undertaken in New South Wales during the crop year 1923-24. The variety Fitzroy ranked 1st in most cases. In these contests seed is furnished by different farmers, and is grown in competition upon a selected farm.—L. R. Waldron.

3191. REMY. Der Kartoffelbau und die Bedeutung des Saatwechsels. [Potato culture and the importance of change of seed.] Mitteil. Deutsch. Landw. Ges. 39: 842-848. 1924.—In this address the speaker discusses chiefly the needs of western Germany for good seed potatoes. As an illustration of the decline in value when seed potatoes are grown in the same place without careful selection, he cites the yield of Lembkes Industrie. The yield from "original" seed was 276 dz. ("Doppelzentner" = 100 kg.); from 1st daughter seed, 213 dz.; from 2nd daughter seed, 124 dz.; and from 3rd daughter seed, 110 dz., per hectare. Physiological diseases are discussed and suggestions made for selection of good seed.—A. J. Pieters.

3192. RUSSELL, E. J. Present-day problems in crop production. Nature 114: 434-437. 1924.—This is the presidential address before Section M (Agriculture) at the British Association at Toronto, August 11, 1924. It deals with the effect of soils upon plants, soil control, microorganisms, and the need of cooperative work in investigation.—O. A. Stevens.

3193. RUSSELL, E. J. The improvement of peaty soils. Part 1.—The true peats. Jour. Amer. Peat Soc. 15: 24-33. 1922.—This is a discussion of the 3 types, Fen. Low-lying, and High-lying peat soils in England, giving the location, description, and composition of each type. The methods of reclamation and adaptability to various crops for each type are stressed.—E. A. Hollowell.

3194. SCHNEIDER, KARL. Die Anlage und Bewirtschaftung von Dauerweiden auf Muschelkalkboden. [Establishment and management of permanent pastures on the Muschelkalk soils.] Mitteil. Deutsch. Landw. Ges. 39: 918-922. 1924.—The difficulties of establishing pastures on these droughty soils are discussed and methods suggested for laying down and managing the pastures. The following seed mixture per $\frac{1}{4}$ hectare is advised: white clover 2 pounds, yellow trefoil 1 pound, English rye grass 3 pounds, Kentucky bluegrass 5 pounds, red fescue 4 pounds, meadow fescue 2 pounds, *Avena flavescens* ("Gold hafer") 1 pound, Weisses Strauss-grass (*Agrostis stolonifera alba?*) 1 pound.—A. J. Pieters.

3195. SHEPHERD, A. N., ET AL. Farmers' experiment plots. Maize for grain and green fodder, 1923-24. Agric. Gaz. New South Wales 35: 761-766. 1924.—Trials were conducted in 4 districts on a number of private farms. In certain cases trials included the use of superphosphate. Only medium yields were secured, the maximum being about 50 bushels per acre.—L. R. Waldron.

3196. STEPHENS, DAVID E. Dry-farm crop rotation experiments at Moro, Oregon. Oregon Agric. Exp. Sta. Bull. 209. 1-45. Fig. 1-2. 1924.—The most important crop grown in Oregon east of the Cascade mountains is wheat. The rainfall is so light (9-20 inches) that it is necessary to summer fallow. It is desirable to substitute a suitable rotation of crops for the present practice of growing wheat after fallow. Five groups of experiments were tried as follows: (1) Land alternately cropped and fallowed; (2) fallow once in 3 years; (3) fallow once in 4 years; (4) no fallow; and (5) rotations with green manure crops. In group (1), spring barley gave the highest yields, with winter wheat 2nd, oats 3rd and spring wheat 4th. The following 3- and 4-year rotations produced higher yields than the standard winter wheat fallow rotation: Spring wheat, barley, potatoes; spring wheat, corn, barley; spring wheat, barley, corn; oats, barley, peas turned under, corn; corn continuously; spring wheat, barley, manured fallow, corn; winter wheat, potatoes, winter wheat, fallow; spring wheat, barley, fallow, corn; winter wheat, peas, winter wheat, fallow; spring barley, spring barley, fallow.—Corn in various rotations produced average yields of 10-20 bushels per acre. Field peas after cereals averaged about 10 bushels per acre. Potatoes were profitable only when grown after fallow. Alfalfa has not been included in any of the regular rotations but in repeated trials has not been a profitable crop at Moro.—C. E. Owens.

3197. STEPHENS, DAVID E., ROBERT WITTHYCOMBE, AND OBIL SHATTUCK. Spring crops for eastern Oregon. Oregon Agric. Exp. Sta. Bull. 204. 1-36. Fig. 1-14. 1924.—The chief source of farm income in eastern Oregon consists of the cereals, wheat, barley, rye, oats and corn. Wheat and rye are usually fall-sown. Cereals sown in the fall are usually more productive than when sown in the spring, but large areas of eastern Oregon are devoted to spring-sown grains.—Experiments to determine the best spring varieties have been conducted at the 3 branch stations at Moro, Union and Burns. Federation, Hard Federation and White Federation are superior to all other spring-sown varieties. Milling and baking trials show that Hard Federation is very satisfactory for bread.—Barley is the most productive crop for spring sowing. Oats have not proved as productive on dry land as barley.—Field peas have given promising yields.—Satisfactory corn varieties are Minnesota 13, North-western Dent, and Walla Walla White Dent.—Indications are that flax might be profitable in certain sections of eastern Oregon.—Potatoes give fair yields, especially Idaho Rural, Early Rose and Irish Cobbler.—C. E. Owens.

3198. TANKERSLEY, N. S. Report on mangold experiments. Fielding Agric. Coll. [New Zealand] Bull. 3. 4-7. 1924.—A mixture of rock phosphate with superphosphate gave the best yields. The iron content of the soil being considerable, it is suggested that the superphosphate, by itself, reverts to iron phosphates, but mixed with rock phosphate it forms a compound similar to basic phosphate.—H. H. Allan.

3199. TENGWALL, T. A. Het verband tusschen uitstoeling en rietproduct. [The relation

between stooling and cane yield.] Arch. Suikerindust. Nederland.-Indië 32: 773-778. 1924.—In this paper P. L. LOHR's article (see this issue, Entry 3178) is discussed and Tengwall comes to the conclusion that no close connection or relation needs to exist between stooling and the cane yield, as the weight per stalk is of influence on the product.—*Peter J. Klapphaak*.

3200. TICE, C. The British Columbia potato. British Columbia Dept. Agric. Bull. 86 (Revised). 1-84. 79 fig. 1924.—This farmers' bulletin on potato growing contains a chapter on diseases.—*J. W. Eastham*.

3201. UGLOW, W. A. Über Weizen und Roggen aus der Ussuri- und der Amurprovinz. [Wheat and rye from Ussuri and Amur provinces.] Zeitschr. Untersuch. Nahrungs- u Genussmittel 45: 341-356. 1923.—Discussion and proximate analyses of a considerable number of grain-samples from this region are given. A bibliography is included.—*E. E. Stanford*.

3202. UNITED STATES DEPT. OF AGRICULTURE. BUREAU OF AGRICULTURAL ECONOMICS. Handbook of United States grades for grain sorghums. (Tabulated and abridged.) 8 p. Govt. Print. Office: Washington, 1924.

3203. VASS, A. F. Sunflowers—their culture and use. Wyoming Agric. Exp. Sta. Bull. 129. 79-107. 1921.—The cultivated form of *Helianthus annuus* has been studied in reference to its forage value and cultural requirements. It was found to yield twice as much silage as corn on high altitude farms and it is equivalent in feeding value to oat and pea silage. In feeding tests, 3 pounds of sunflower silage replaced 1 pound of alfalfa hay. Sunflowers for silage should be harvested when the seed are in the dough stage and the rays are dry and falling. The seeding of the crop should be made several weeks earlier than the seeding of corn.—*E. B. Payson*.

3204. VIDAL, M. D. Observations sur divers Blés à L'Ecole Nationale D'Agriculture de Montpellier en 1922-23. [Observations on different wheats at the National School of Agriculture of Montpellier, during 1922-23.] Ann. École Nation. Agric. Montpellier 18: 38-42. No date.—A report is given of a field test with a number of hybrids and imported varieties of wheat.—*F. F. Halma*.

3205. WALLACE, K. C. Field experiments with peanuts. Grafton Experiment Farm, 1923-24. Agric. Gaz. New South Wales 35: 795-796. 1924.—A number of varieties were given a comparative trial. White Spanish gave the maximum yield of 1172 pounds per acre.—*L. R. Waldron*.

3206. WARD F. E. Turnip and rape seed production. New Zealand Jour. Agric. 25: 206-207. 1922.—This article discusses the activities of a seed grower, his methods of successful production and means employed to prevent cross-fertilization. Imperial green globe, Hardy green globe and Red paragon turnips, Garton's superlative, Champion and Crimson swedes and Broadleafed Essex rape were the seed grown. The yields of seed per acre have averaged 400 pounds for turnips, 300 pounds for swedes and 600 pounds for rape.—*Mary R. Burr*.

3207. WELLENSIEK, S. J. Een onderzoek naar de factoren, die ontijdige knolvorming bij vroege aardappels bepalen. [Study of the factors determining premature tuber formation in early potato varieties.] Tijdschr. Plantenz. 30: 177-226. 2 pl. 1924. Also Dissertation, Wageningen, 1924.—Under certain conditions the early potato varieties upon planting do not give rise to plants but form short sprouts, each of which ends in one or more small tubers. Such tubers fail to send any shoots above the ground, but in some cases the newly formed tubers grow through and send a few shoots above the ground. Such plants however are much delayed in their development. A number of factors individually and in the aggregate are responsible for this. The early potato varieties as a rule begin to form sprouts almost as soon as dug. This makes it necessary to remove the sprouts several times during the winter. However, the last formed sprouts are not removed and the tubers are planted with the sprouts in order to shorten the vegetative period. The earlier the tubers begin to sprout and the more sprouts (quantitatively taken) they form the greater becomes the chance for premature tuber formation. Insufficient soil moisture during the formation and before the digging of the tubers, early digging, and size of the tuber affect to some extent the early sprout formation. Storing of the tubers in the dark and in high temperature greatly accelerates sprout formation. Storing in the light or at low temperature practically eliminates

sprout formation.—The predisposition for premature tuber formation of the seed tubers thus acquired expresses itself preferably with low temperature and dryness of soil after planting. The more sprouts the tubers have lost and formed the greater becomes the chance for premature tuber formation, even with comparatively high soil temperature and moisture. Premature tuber formation can be avoided by late digging, use of large seed tubers, cool storage in the light, planting at high temperature, and moist soil. The actual cause of this phenomenon the author sees in the decrease of moisture content of the tubers. Artificial desiccation of tubers leads also, upon planting, to premature tuber formation.—*D. Atanasoff.*

3208. WILLIAMS, R. D. *Methods of covering grass seed.* Jour. Ministry Agric. Great Britain 30: 1134-1139. 1924.—Additional investigations are reported on the depth of covering best suited to the seed of perennial rye grass, meadow foxtail, timothy, and rough-stalked meadow grass, and as to the methods of covering most applicable to ordinary field conditions. The methods of covering adopted were: seed uncovered, smooth roller, horse hay rake followed by smooth roller, chain-harrow followed by smooth roller, and light peg-harrow followed by smooth roller. In addition, $\frac{1}{2}$ of the plots were chain-harrowed and $\frac{1}{2}$ were rolled as the last operation before sowing.—Of the implements employed, the best for covering the large seed of perennial rye grass and meadow foxtail were the peg and chain-harrows which gave about equally good results. The chain-harrow proved a better implement for covering small seed than the peg-harrow.—Although the differences between the results of the 2 pre-sowing operations were in most cases small, yet the plots which were chain-harrowed as the last operation before sowing, on the whole, gave slightly better stands than the plots which had been rolled immediately before sowing.—*M. B. McKay.*

3209. ZADE. *Die Saatgutkontrolle in Dänemark.* [Seed control in Denmark.] Mitteil. Deutsch. Landw. Ges. 39: 848-851. 1924.—An account is given of the seed control and seed certification system in Denmark.—*A. J. Pieters.*

SOIL SCIENCE (EDAPHOLOGY)

3210. ABERSON, J. H., FRIDA EVERSMAAN, EN J. W. VAN DIJK. *De reactie van den grond en de behoefte aan kalk.* [Soil reaction and the need of lime.] Landbouwk. Tijdschr. 36: 345-368, 401-417. 1924.—The views of Baumann and Gully that muck makes acid free from salts is not accepted. The difference between the action of 1- and 2-valent kations is made clear. The humic acids of muck and sand soils have the same equivalent weight and therefore have probably also the same chemical composition. The theory of physiologically acid and alkaline salts is not according to facts. The differences are based on the more or less rapid washing away of lime as a consequence of the decomposition of manures. The action of lime is in the first place neutralizing, and furthermore, influences the physical and chemical properties of the soil and the life of lower organisms. Methods for determination of the quantity of lime needed to neutralize acid soils are very different. The values vary and it is impossible to determine which one is best. The reaction of sand and muck soils is caused by humic acids and has much influence on the development of lower organisms.—*J. C. Th. Uphof.*

3211. ALBES, A., AND NOLTE, O. *Düngungsversuche mit Stickstoff auf Weisen.* [Experiments with nitrogenous fertilizers on meadows.] Mitteil. Deutsch. Landw. Ges. 39: 764-770. 1924.—A detailed account of 39 fertilizer experiments on different estates is given. Ammonium sulphate increased yields largely and the authors dispute recent statements that the application of nitrogenous fertilizers to meadows does not pay.—*A. J. Pieters.*

3212. BRENNER, WIDAR. *Azotobacter in finnländischen Böden.* [Azotobacter in the soils of Finland.] Geolog. Kommissionens i Finland Agrogeolog. Meddel. 20. 1-15. 1924.—Among 200 soil samples taken in various parts of Finland only 2 contained *Azotobacter*. That this bacterium is very rare in Finland is indicated by the high acidity and weak buffer action of both the cultivated and the virgin soils of Finland. After inoculation *Azotobacter* developed in occasional instances in soils with pH 5.8-6.0 while the limit commonly appears to be about pH 6.7. Some soils, particularly the iron oxide layer of the podsol profile, have a toxic effect on *Azotobacter* independently of their reaction, as they check its development even after the addition of calcium carbonate.—*R. Collander.*

3213. CHAERIOU, ANDRE. Sur l'absorption de la potasse par l'acide humique. [Absorption of potassium by humic acid.] *Compt. Rend. Acad. Sci. Paris* 179: 206-209. 1924.—After permitting humic acid to absorb potassium in different concentrations, the excess potassium was washed out, the organic matter destroyed by nitric acid, and the potassium absorbed then determined. It was found that from a 1% solution of potassium, 0.35 gm. of potassium was taken up by 2 gm. of humic acid. The relationship between the potassium and the humic acid is regarded as an absorption and not a chemical combination. It is found that more potassium is absorbed from the carbonate than from the bicarbonate of this element. It is found that if humic acid which has absorbed potassium is washed with a calcium compound, the calcium will replace the potassium in the humic acid. If humic acid is placed in a mixture of the bicarbonates of K and Ca, it will absorb the latter and leave the former. Potassium may also be replaced by washing with salts of barium or magnesium, or with ferric oxide solution.—*C. H. Farr.*

3214. DEMOLON, A., AND V. DUPONT. Sur la résistance des sols à l'acidification. [Resistance of soils to acidification.] *Compt. Rend. Acad. Sci. Paris* 179: 300-302. 1924.—Tables are given of soils of wheat and garden lands. It is concluded that the solution of a soil deprived of active calcium carbonate possesses only feebly the properties attributable to humates. Colloidal clays exercise a rapid buffer action which is very intense in the presence of sulphuric acid.—*C. H. Farr.*

3215. DEMOLON, A., AND V. DUPONT. Sur quelques caractères des tourbes des vallées crayeuses du nord de la France. [Certain characteristics of the peat in the chalk valleys of northern France.] *Compt. Rend. Acad. Sci. Paris* 179: 72-74. 1924.—Analyses of samples of peat from this region show a variation in the composition at different depths. There is an increase downward in the amount of lime, a decrease in silica and an irregular variation in alumina. The author concludes that there is a fraction of lime in the lower part and that lime from the soil waters is held by the peat in amounts greater than is necessary to neutralize the acids.—*T. D. Rice.*

3216. FRANÇOIS-PÉREY, JEAN. Influence de la lumière solaire sur le développement d'un protozoaire du sol *Colpoda cucullus*. [Influence of solar light on the development of *Colpoda cucullus*, a soil protozoan.] *Compt. Rend. Acad. Sci. Paris* 179: 232-234. 1924.—Diatoms of the marine plankton are most active between March and June, and they have a second maximum in October. This seems to be due to a periodicity in humidity, rather than in temperature, though Heidman suggests light as the conditioning factor. Protozoa of the soil have 2 maxima, in April and November respectively. The table of data shows that solar radiation has an effect upon the species studied.—*C. H. Farr.*

3217. GARDNER, WRIGHT A. The decomposition of salicylic aldehyde by soil organisms. *Science* 60: 503. 1924.—Salicylic aldehyde has been found in soils and is known to kill or injure wheat plants. Twenty-seven cultures failed to show decomposition by bacteria, and sub-cultures did no better.—*C. J. Lyon.*

3218. GUITTONNEAU, G. Sur l'ammonisation de l'azote aminé par les microsiphonées du sol. [The ammonification of amine nitrogen by the microsiphons of the soil.] *Compt. Rend. Acad. Sci. Paris* 179: 512-514. 1924.—It is concluded from data presented that ammonification of amine nitrogen by the action of the Microsiphonaeae is established as occurring in the ground; but it is shown that the amino acids studied are not attacked with equal facility by the organisms of this group. There seems to exist an adaptation of certain species to certain acids; and one can presume that this adaptation is in relation to the nature of the ternary carbon products arising by deamination.—*C. H. Farr.*

3219. GUITTONNEAU, G. Sur l'utilisation de l'azote minéral par les microsiphonées du sol. [Utilization of mineral nitrogen by the microsiphons of the soil.] *Compt. Rend. Acad. Sci. Paris* 179: 788-790. 1924.—It is shown by data presented that the Microsiphonaeae can assimilate nitric, nitrous, and ammoniacal nitrogen. Of these, ammoniacal nitrogen is most favorable, but the differences are not great. There is a marked difference, however, in the development on a given type of mineral nitrogen with different nutrient carbon compounds. Glucose, glycerin, and starch were tried.—*C. H. Farr.*

3220. HILGENDORF, F. W. Evaporation from the soil. Canterbury [New Zealand] Agric.

Coll. Mag. 4: 666-670. 1 fig. 1919.—The diminution of evaporation due to shelter belts of trees is shown by experiments with free water surface evaporimeters.—*H. H. Allan.*

3221. JOHNSTON, W. W., AND W. L. POWERS. A progress report of alkali land reclamation investigations in Eastern Oregon. Oregon Agric. Exp. Sta. Bull. 210. 1-27. Fig. 1-13. 1924.—Conclusions arrived at from 4 seasons' field and tank experiments with natural "black alkali" land are as follows: Neutral salts can be removed by leaching alone, but sodium carbonate was not eliminated by this process nor was the physical condition of the soil improved. Chemical treatments in addition to leaching and drainage are necessary to remove neutral salts resulting from the decomposition of sodium carbonate.—Seven to 10 tons of gypsum per acre were necessary to neutralize the sodium carbonate sufficiently to secure a stand of sweet clover.—A fair yield of rye and a good stand of sweet clover were secured by the application of 500 pounds of sulphur and 20 tons of manure per acre.—Manure was effective with sulphur and gypsum but not when used alone.—Farmers have been able to secure cheap drainage by use of the "Purvis sluicer." This is a cylindrical iron structure provided with projecting teeth which is dragged lengthwise in the ditch by teams.—Getting uncleared, drained land into pasture and using frequent irrigations has proved to be an economical method of utilizing the hard alkali lands of Malheur County.—*C. E. Owens.*

3222. JONES, S. C. Marls for liming soils. Kentucky Agric. Exp. Sta. Circ. 32. 1-12. Fig. 1-2, map. 1924.—The necessity of limestone as a fertilizer for Kentucky farms is discussed. The discovery of Silurian calcareous clays or marl beds in some 24 counties lying immediately around the border of the "Bluegrass region" is reported. The beds range in thickness from a few feet to 84 feet. The marls range in neutralizing value from 2.6 to 87.1. They are valuable for agricultural purposes and will furnish a cheap source of lime for a considerable area in Kentucky. Marls of value in the Upper Waverly formation (Harrodsburg limestone) are also reported as being present in about 15 counties in south central Kentucky. These marls should be spread at about twice the rate of ground limestone.—*W. D. Valleau.*

3223. PENG, CHIA YUAN. [Soil composition in relation with crop production.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 8: 725-731. 1923.—The importance of soil composition in relation with crop production is discussed under the following points: (1) Decayed vegetable matters in the soil as plant food, (2) planting leguminous plants as source of nitrogen, (3) practice of crop rotation such as to balance the supply of plant food, (4) effect of lime on soil texture, and (5) plant food elements in the soil. The author also relates the function of phosphate upon the plant and its supply.—*Chunjen C. Chen.*

3224. POWERS, W. L. Supplemental irrigation for the Willamette Valley. Oregon Agric. Exp. Sta. Circ. 57. 1-8. Fig. 1-2. 1924.—Supplemental irrigation on certain soils of the Willamette Valley would be profitable. Water could be supplied by pumping from streams or from driven wells in the gravel substratum of river bottoms. Pumps, motive power and costs are discussed.—*C. E. Owens.*

3225. RUSSELL, E. J. The new nitrogenous fertilizers of Great Britain. Agric. Gaz. Canada 11: 181-184. 1924.—Nitrate of lime, nitrate of ammonia, urea, ammonium chloride and cyanamide are discussed as to desirability as nitrogen carriers in the fertilizer practice of Great Britain. Yields are given of mangolds, potatoes, barley and wheat as grown in various soils with nitrate of soda and nitrate of lime and no nitrogenous top dressing. Likewise nitrate of ammonia and sulphate of ammonia are compared using mangolds, potatoes and wheat as indicator crops. Hay was the indicator crop for comparison of nitrate of ammonia and nitrate of soda and no nitrogen. Barley and potatoes served as indicator crops in the comparison of urea and sulphate of ammonia. In the comparison of ammonium chloride with ammonium sulphate, potatoes, mangolds and cereal grains were grown. Cyanamide received brief mention. Nitrate of lime is valued on account of its non-acid nature. Nitrate of ammonia is very effective. Urea is valuable on account of its concentration and absence of harmful effects. Ammonium chloride needs further investigation.—*James E. Chapman.*

3226. SMOLIK, LADISLAS. Influence des électrolytes sur la surface totale des éléments du sol. [The influence of electrolytes on the total surface of soil particles.] Compt. Rend.

Acad. Sci. Paris 179: 211-213. 1924.—A comparison is made of unwashed and washed air-dried soils as to their hygroscopicity. An analysis is also made to determine which elements are most readily leached out. Mg is more susceptible to leaching than any other element tested; Al is not washed out at all. The order in susceptibility to leaching is: Mg, Mn, S, P, K, Ca, Si, Fe, Al. The surface of the soil particles is dependent on the temperature. Air dried soil loses 11-15% of its total surface. By increasing the salt content of the soil its total surface is diminished; by washing out the salts the total surface is increased.—*C. H. Farr.*

3227. WINOGRADSKY, S. *Sur l'étude microscopique du sol.* [On the microscopic study of the soil.] *Compt. Rend. Acad. Sci. Paris* 179: 367-371. 1924.—The current methods of isolation culture of soil organisms on conventional media are very inadequate, for they give only qualitative results, and not the quantity of the microbes, nor their formation on natural media and mutual interactions.—Conn's method is reviewed; it is suggested that it is worthy of more attention than it has been given. His results on the prevalence of non-spore formers in the soil agree with those of the author. The technical difficulties are attributable to mineral debris in the soil, colloidal materials, and the necessity of collecting soil particles at different levels. A new method of distributional study is described. The soil is washed 3 times, decanted in water of a given volume, and then centrifuged. Erythrosin is found to be the most desirable staining reagent.—*C. H. Farr.*

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

CARROLL W. DODGE, *Editor*

CHARLES A. WEATHERBY, *Assistant Editor*

(See also in this issue Entries 3476, 3512, 3747, 3752, 3767, 3771, 3906)

3228. ANONYMOUS. Dr. Manuel M. Villada. *México Forest.* 2: 56-57. 1924.—This is a brief outline of Villada's life and work. He was in charge of the botanical section of the Museo Nacional in Mexico City since 1868.—*W. N. Sparhawk.*

3229. ANONYMOUS. Dr. W. B. Hemsley, F.R.S. *Nature* 114: 616-617. 1924.—William Botting Hemsley was born at East Hoathly, Sussex, December 29, 1843, and died October 7, 1924. His family had long been connected with horticulture and his interest in plants was such that he entered Kew as a gardener in 1860. Before the expiration of the usual 2-year term he was transferred to the herbarium where his ability attracted the attention of G. Bentham. He advanced rapidly, becoming Keeper of the Herbarium and Library in 1899, retiring in 1908. His health was not good from the beginning, causing interruptions in his work and a period of retirement from 1867 to 1874. He was an authority on insular floras and his larger works included the material of the Challenger expedition, botany in "Biologia Centrali-Americana," flora of China, collaborator on "Flora of High Asia" and "Flora of tropical Africa."—*O. A. Stevens.*

3230. ANONYMOUS. H. Kraemer. *Nature* 114: 583. 1924.—Kraemer was born July 22, 1868, and died September 9, 1924. He studied at the Philadelphia College of Pharmacy, Columbia University, and at Marburg where he received his Ph.D. degree. He was professor of botany and pharmacognosy at Northwestern University, the Philadelphia College of Pharmacy and the University of Wisconsin. He served as editor of the American Journal of Pharmacy from 1899 to 1917 and was recognized throughout the scientific world as a leader in this subject.—*O. A. Stevens.*

3231. ANONYMOUS. Jacques Loeb. *Science* 60: 518. 1924.

3232. ANONYMOUS. Sir Henry Cusack Wingfield Hawley, Bart. (1876-1923). *Naturalist [London]* 1924: 186-188. *Portrait.* 1924.

3233. ANONYMOUS. The Library Association's subject index. *Nature* 114: 402-403. 1924.

3234. AMANN, J. *Nécrologie.* *Rev. Bryologique* 51: 48. 1924.—Announcement is made of the death of Canon [O.] Bender, of the Congregation of St. Bernard, Switzerland, on August 1, 1924, at the age of 30 years. He had made a special study of Swiss mosses.—*A. W. Evans.*

3235. BOMMER, C. *Considerations sur la documentation en histoire naturelle.* [The use of records in natural history.] Bull. Jard. Bot. Etat Bruxelles 6: 195-206. 1921.—The author discusses the precautions which should be taken by curators of herbaria in order to secure the greatest use of type material consistent with its safety. Drawings, photographs and microscopic preparations are useful in this connection. The author suggests that institutions might make a beginning by an exchange of uniform photographs of the types of species not yet figured.—*E. De Wildeman.*

3236. BRICK, C. *Nekrologe deutscher Botaniker, Otto Jaap.* [Necrology of German botanists, Otto Jaap.] Bot. Archiv. 4: 8. 1923.—Jaap was born in 1864 in "Triglitz in der Prignitz" and after an education in the local schools, he taught in a girls' school in Hamburg until failing health forced him to retire in 1912. He died in Hamburg in 1922. He is best known as a student of bryology and mycology. He issued several series of exsiccati. A bibliography of 53 titles is appended.—*C. W. Dodge.*

3237. CHAPAIS, J.-C. *L'abbé Provancher Educateur—un témoignage.* [Abbé Provancher, educator—a testimony.] Nat. Canadien 50: 193-195. 1924.—The author testifies to the genius of Provancher as an educator in the natural sciences, and specifies among other publications the following: "Traité élémentaire de Botanique à l'usage des Ecoles" (1858); "Le Verger Canadien" (1862); "Le Potager, Le Verger, et le Parterre" (1874); "La Flore Canadienne" (1862); and "Le Naturaliste Canadien" (1868).—*A. H. MacKay.*

3238. CLIFFORD, F. W. *World list of scientific periodicals.* Nature 114: 401-402. 1924.

3239. DE WILDEMAN, E. *Élie Marchal, Conservateur honoraire du Jardin Botanique de l'État, professeur honoraire des écoles normales de l'état et de la ville de Bruxelles 1839-1923.* Bull. Jard. Bot. Etat Bruxelles 9: 1-20. 1923.—Élie Marchal was born at Wasigny in the French Ardennes in 1839 and died at Ebly in Belgian Luxembourg in 1923. Educated at Nivelles, he taught in various secondary schools (1862-1871) and joined the staff of the botanic garden at Bruxelles in 1871, giving lectures in various normal schools until his retirement in 1899. His early work in bryology was followed by monographs on the Hederaceae, and by papers on coprophilous fungi. Later he collaborated with his son, Émile, in work on starch and on apospory in mosses. A bibliography of 44 titles is appended.—*Author.*

3240. DE WILDEMAN, E. *François-Marie-Camille Vermoesen.* Bull. Jard. Bot. Etat Bruxelles 8: i-ix. 1922.—Vermoesen was born at Malderen in Flemish Brabant in 1882 and died at Louvain in 1922. He spent several years in various scientific posts in the Belgian Congo, in the botanic garden at Brussels and in the University of Louvain. Most of his work deals with Congo forestry. A bibliography of 13 titles is appended.—*Author.*

3241. GANDOGER, MICHEL. *Historique de l'école analytique.* [History of the analytical school.] Bull. Soc. Bot. France 69: 601-605. 1922.—The writer discusses a number of early taxonomists and gives a long list of authors with a publication by each.—*P. A. Young.*

3242. GOMBOCZ, ENDRE. *Adatok az ujabbkori magyar botanika, történetéhez.* [Contribution to the recent history of Hungarian botany.] Bot. Közlemenyek 9: 2-6. 1920-1921 [1921].—Farkas Cséry de Nagyajta founded an excellent botanic garden in Kraszna in Hungary amid difficulties and lack of appreciation. With indefatigable zeal he worked to found a botanic garden in every important town of Hungary, and suggested the botanic garden of the protestant college of Kolozsvár. The family mansion contained a little museum, herbarium and library along with other collections. Baumgarten named *Silene Cséry* in his honor.—*Gy. de Istvanfi.*

3243. HASKINS, CHARLES HOMER. *Studies in the history of mediaeval science.* xiv + 411 p. Harvard University Press: Cambridge, [Massachusetts] 1924.—Much of this work deals with the introduction of Arabic science into Europe, and botany is only occasionally mentioned. Much information is given regarding the location of mediaeval scientific manuscripts, their authors and translators.—*C. W. Dodge.*

3244. HUARD, V.-A. *L'abbé Provancher.* Nat. Canadien 49: 274-276. 1923; 50: 87-89, 113-117, 137-139, 1923; 50: 153-163, 183-185. 1924; 51: 17-23, 46-47, 60-64, 86-92, 116-119. 1924.—This is a continuation of the biography of the founder of *Le Naturaliste Canadien*. [See also Bot. Absts. 11, Entry 1044; 12, Entry 6208].—*A. H. MacKay.*

3245. HUARD, V.-A. *Le Jubilé du Naturaliste Canadien.* [The jubilee of "Le Natura-

liste Canadien." Nat. Canadien 50: 3-7. 1923.—An historical sketch is given of the Canadian naturalist monthly which had now attained to its fiftieth year.—*A. H. MacKay.*

3246. J[ACKSON], B[ENJAMIN] D[AYDON]. *J. Britten.* Nature 114: 583. 1924.—James Britten was born at Chelsea May 3, 1846, and died October 8, 1924. He was a keen debater and critic, an author of many essays and of several bibliographical and biographical works. He served as editor of the Journal of Botany from 1879 until his death.—*O. A. Stevens.*

3247. KRIEGER, LOUIS C. C. Catalogue of the mycological library of Howard A. Kelly. ix + 260 p. Privately printed: Baltimore, 1924.—This extensive bibliography contains between 7000 and 8000 titles dealing with fungi and lichens. The introduction by HOWARD A. KELLY contains some biographical information and notes on the location of important series of paintings of fleshy fungi.—*C. W. Dodge.*

3248. LAKOWITZ, CONRAD. Nekrologe deutscher Botaniker, Theodor Bail. [Necrology of German botanists, Theodor Bail.] Bot. Archiv 4: 2-3. 1923.—Theodor Bail was born in Hainau in 1833 and died in Danzig in 1922. After finishing his studies in Breslau in 1858 he taught in Posen, and from 1862 until his retirement in 1900 in the Realgymnasium zu St. Johann, in Danzig. Most of his publications were in the field of mycology.—*C. W. Dodge.*

3249. LATOUR, B. Origine des plantes cultivées. [Origin of cultivated plants.] Nat. Canadien 51: 35-40. 1924.—This is a summary of an article in a small "Guide aux collections de plantes vivantes" by M. A. GUILLAUMIN, "assistant à la chaire de culture du Museum national d'histoire naturelle." In the Neolithic age, 8000-6000 years B.C., there were wheat, rye, barley and oats. In the Eneolithic age, 2000 years B.C., millet and flax were added. In the Bronze age, 900 B.C., came legumes, beans and lentils, cherry trees, vines, and rice in the Orient; soy beans in China and Japan; tea in China; cabbage, radish, garlic, onion, leek, asparagus, lettuce, cucumber, water-melon, castor bean, pomegranate, fig, hemp, and maize in America. Then follow the plants of the Graeco-Roman age, of the Middle age, and lastly those of modern times.—*A. H. MacKay.*

3250. MEISEL, MAX. A bibliography of American natural history: the pioneer century, 1769-1865; the role played by the scientific societies, scientific journals, natural history museums and botanic gardens, state geological and natural history surveys, federal exploring expeditions in the rise and progress of American botany, geology, mineralogy, paleontology and zoology. Volume 1. An annotated bibliography of the publications relating to the history, biography and bibliography of American natural history and its institutions during colonial times and the pioneer century, which have been published up to 1924; with a classified subject and geographic index; and a bibliography of biographies. 244 p. Premier Publishing Co.: Brooklyn, New York, 1924.

3251. OSBORN, HERBERT, AND OTHERS. Biological abstracts. Science 60: 485-489. 1924.—The committee which is investigating the suggestion of a single comprehensive biological abstract journal reports the results of recent work. The answers to requests for individual opinions on its last report numbered nearly 4500 and are tabulated in respect to the views expressed. The attitude of the committee on particular problems is explained. It plans coöperation with and not competition against existing abstracting agencies. Separate journals for botany and zoology are considered impracticable because certain fields are at least partly common to both. Special services to narrow fields are thought to involve duplications and to be expensive and less liable to general support. Ease of use of the large work will be safeguarded by subject groupings and tables of contents. The bulk of the work promises to be no greater than in the case of Chem. Absts. Adequate financial support is now being sought.—*C. J. Lyon.*

3252. P. D. Sir Isaac Bayley Balfour. Proc. Roy. Soc. London B 96: i-xvii. Portrait. 1924.—This is a detailed account of the distinguished ancestry, training and scientific career of the late Professor of Botany at Edinburgh, Regius Keeper of the Royal Botanical Gardens there, and King's Botanist for Scotland,—all positions held earlier by his father, Hutton Balfour. Especial emphasis is placed upon the results of Sir Isaac's boyhood apprenticeship at practical gardening, his qualities of initiative and personal distinction of manner, and his fine scientific and business judgment. Founder of Annals of Botany in 1887, successively Professor at Glasgow, Oxford, and Edinburgh, at the last named place he developed an effective Institute

of Botany and greatly improved the Gardens. Following his important early floristic work, notably that on Socotra, he devoted many years to the systematic and horticultural problems opened up by the explorations of western China. He gave particular effort to *Primula* and *Rhododendron* in this connection. His wide and precise working knowledge of forestry and other plant industries proved invaluable to his government during the war, and his unremitting labors at this time are believed to have hastened his death.—*P. B. Sears.*

3253. P., D. Sir John Kirk. *Proc. Roy. Soc. London B* 94: xi-xxx. 1923.—Born in 1832, a pupil in botany of Balfour while studying medicine at Edinburgh, his botanical explorations while a surgeon in the Crimean war and later with Livingstone in Africa, made fundamental contributions to the collections at Kew and elsewhere. Kirk discovered the important rubber genus *Landolphia* and while at Zanzibar made the abolition of the slave trade economically possible by developing rubber, copal, and other plant industries.—*P. B. Sears.*

3254. SHERRINGTON, C. S. Address of the president at the anniversary meeting, Nov. 30th, 1922. *Proc. Roy. Soc. London B* 94: i-xvi. 1923.—Brief appreciations are given of the following, among other fellows of the Royal Society deceased during the year: John Kirk, African explorer and economic botanist; Benjamin Moore, one of the founders of the *Biochemical Journal*; August Desiré Waller, electrophysiologist; Wm. Carruthers, Keeper in the Department of Botany at the British Museum; Henry John Elwes, author of the "Trees of Great Britain"; Isaac Bayley Balfour, systematic botanist, Keeper of the Royal Botanical Gardens at Edinburgh, Professor of Botany at Edinburgh, etc. The address includes a discussion of the new trend toward endowment of research, also an announcement of the awarding of the Darwin medal to R. C. Punnett.—*P. B. Sears.*

BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ARTHUR H. GRAVES, *Assistant Editor*

(See also in this issue Entries 3361, 3415, 3417, 3451, 3564, 3622, 3787, 3788, 3789)

3255. ASTON, B. C. The cultivation of New Zealand plants. *New Zealand Jour. Sci. and Tech.* 7: 125-128. 1924.—Attention is drawn to certain choice plants that have escaped notice in COCKAYNE's book with the same title, and a plea is made for the establishment of a national botanical garden.—*H. H. Allan.*

3256. BERRY, JAMES B. Teaching agriculture. An analysis of the teaching activity in its relation to the learning process. (New World Agriculture Series.) *xiv + 230 p., Frontispiece + fig. 1-23.* World Book Co.: Yonkers, N. Y.; Harrap and Co., Ltd.: London, Calcutta, and Sydney, 1924.

3257. BRISON, GERALD. Les Sciences et notre enseignement secondaire. [The sciences and our secondary education.] *Nat. Canadien* 50: 171-175. 1924.—The writer emphasizes Canon Emile Chartier's declaration at Saint-Sulpice, that it is a mistake to make education exclusively literary and classical.—*A. H. MacKay.*

3258. CAROU, OMER. Avis aux collectionneurs de plants. [Advice for the collectors of plants.] *Nat. Canadien* 51: 4-5. 1924.

3259. CAROU, OMER. Collections d'histoire naturelle. [Natural history collections.] *Nat. Canadien* 50: 169-171. 1924.—The great value of collections, especially in educational institutions, is emphasized, and a place of honor is given to the School of Agriculture of St. Anne de la Pocatière, in the Province of Quebec.—*A. H. MacKay.*

3260. CUNNINGHAM, ANDREW. Practical bacteriology: an introductory course for students of agriculture. *vii + 188 p.* Oliver and Boyd: Edinburgh and London, 1924.

3261. HU, HSIEN SU. [The teaching of botany.] (Text in Chinese.) Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 7: 1181-1191. 1922.—The author calls attention to the weakness of botanical science in the Chinese schools in the past and present and points out the importance of botany in its relation to life and education. The need of modification in the present teaching methods is discussed. Suggestions for teaching methods, for equipments of the course,

and for the organization of the department in the Chinese junior high schools, high schools, and colleges are given.—*Chunjen C. Chen.*

3262. LAWRENCE, WILLIAM E. A laboratory manual for the study of general botany prepared for use at the Oregon State Agricultural College. 202 p. *Illus.* O. A. C. Press: Corvallis, Oregon, 1924.—“This manual has been prepared to serve the double purpose of a guide for study and a text of information necessary for efficient study. It has been prepared on the belief that students are naturally eager to learn and will find pleasure in doing constructive thinking when suitable laboratory material is placed in their hands and they are told not only what to do with it and how to do it, but also supplied with enough significant information pertaining to the subject in hand so that they will be prepared to think constructively while they are acquiring certain information about plants.”—The following aims illustrate the purpose and scope of this manual: To arouse interest as the study is taken up; to give adequate directions for study; to make a definite statement of requirements; to give sufficient information to furnish an adequate basis for thought; to give questions designed to stimulate thought; to coordinate the exercises as a whole; to require and in most cases to supply an outline for a written report; to give references for optional study; and to coordinate with other courses in botany and plant pathology.—Part I takes up the plant with its various organs and functions. Part II comprises a study of the 4 great groups of plants.—*Frederick V. Rand.*

3263. SMYTH, ELLISON A., JR., AND OTHERS. As students understand it. *Science* 60: 566–568. 1924.—The discussion of the mistakes and misconceptions of students was begun by the author in *Science* for Aug. 29, 1924, and continued by 2 contributors in *Science* for Oct. 10. Three other teachers here give lists of curious answers with remarks upon them, while Smyth insists that the original list came from classes that did not depend entirely upon the lecture system to present the facts.—*C. J. Lyon.*

3264. WELCH, M. W. Osmosis demonstration for classes in biology. *Science* 60: 548–549. 1924.—Before the celloidin is poured into the bottle in making celloidin bags, the inner surface of the bottle may be covered with a 10% solution of molasses and water which is allowed to become thoroughly dry before adding the celloidin. The immersion of the bottle in water after the ether has left the celloidin results in the solution of the molasses layer and an easy removal of an unbroken bag.—*C. J. Lyon.*

3265. WICHELHAUS, H. Vorlesungen über chemische Technologie. [Lectures on chemical technology.] Vol. I. Anorganischer Teil. 434 p. 104 fig. 1921. Vol. II. Organischer Teil. 454 p. 106 fig. 1923. Theodor Steinkopf: Leipzig, 1921–1923.—The 1st volume treats of the inorganic part of chemical technology; the 2nd volume contains much of the technical and commercial treatment of plant products. Pages 31–86 of vol. II describe the oils and fats, especially linseed oil, olive oil and palm oil. Various types of machines are described for pressing oil and extracting it by solvents. The manufacturing processes for glycerin and fatty acids are also mentioned; pp. 86–193 give the preparation of carbohydrates, especially of fibres, paper manufacturing, celluloid, starches, dextrine, glucose, etc. There are extensive descriptions of cane sugar and beet sugar manufacturing; treatment of the plant material in the factory; extracting and purification of the sugar; pp. 193–249 include commercial alcohol production.—*J. C. Th. Uphof.*

CYTOLOGY

GILBERT M. SMITH, *Editor*

(See also in this issue Entries 3427, 3436, 3455, 3460, 3470, 3570, 3639, 3730, 3831, 3840)

3266. ALEXEIEFF, A. Comparaison entre la structure des spermatozoïdes et celle des Flagellés. [Comparison between the structure of spermatozoa and that of flagellates.] *Arch. Protistenk* 49: 104–111. 2 fig. 1924.—Analogies are pointed out between the spermatozoa and *Trichomonas* (or an ideal flagellate with certain structures of *Trichomonas* and the spiral parabasal body of *Devesovivina*). Thus, the axostyle corresponds to the axial filament of the spermatozoan, the undulating membrane to that present in certain sperms, the parabasal body to the spiral filament, the centrosomes of the blepharoplasts, etc. This analogy is con-

sidered an example of convergence under similar life conditions, the flagellates mentioned being parasitic.—*Harold Kirby.*

3267. BLACKBURN, KATHLEEN B., AND J. W. HESLOP HARRISON. A preliminary account of the chromosomes and chromosome behaviour in the Salicaceae. *Ann. Bot.* 38: 361-378. 11 fig. 1924.—The fundamental chromosome number is 19. *Populus tremula* and *P. nigra* are diploid, while *P. balsamifera* is tetraploid as judged by somatic counts. In *Salix*, diploid, tetraploid and hexaploid species were found. In addition, a form of *S. triandra* showed 22 chromosomes and *S. phylicifolia* 44. Abnormalities in meiosis suggestive of hybridity were seen in only 3 species, (*S. fragilis*, *S. aurita* and *S. andersoniaria*). Even in these the departures from the normal were not great. Three recognized species hybrids were examined; 2 behaved quite normally during meiosis while one showed abnormalities. The conditions in *Salix* are therefore very different from those in such genera as *Rosa*, and it is suggested that the variability of the genus is due to the perfect ability to cross within the major groups, followed by segregation in later generations. Diploidy, tetraploidy and hexaploidy are of such irregular incidence in the various sections of the genus as to have no wide application in specific differentiation. Some evidence of the existence of heterochromosomes, possibly sex-determining, was found.—*W. P. Thompson.*

3268. DENHAM, HUMPHREY JOHN. The cytology of the cotton plant. I. Microspore formation in Sea Island cotton. *Ann. Bot.* 38: 407-432. Pl. 11-14. 1924.—The reduction division, which is described and figured in detail, takes place along normal telosynaptic lines. Points of special interest are: (1) the prominent perinuclear zone which is concerned with spindle formation; (2) the apparent pulling of the chromosomes to the centre of the nucleus in diakinesis by the contraction of connecting fibrils; (3) the method of tetrad formation by furrowing. The haploid chromosome number is 26.—*W. P. Thompson.*

3269. DENHAM, HUMPHREY JOHN. The cytology of the cotton plant. II. Chromosome numbers of old and new world cottons. *Ann. Bot.* 38: 333-338. 11 fig. 1924.—Chromosome counts were made on 32 varieties of cotton, including American, Sea Island, Egyptian, Indian and Chinese types. The Asiatic types all showed a haploid chromosome number of 13 and the others 26.—*W. P. Thompson.*

3270. DOGIEL, A. S. Einige neue Befunde im Bau der Flimmerepithelzellen des Menschen und der Säugetiere. [A new observation in the structure of the ciliated epithelium cells of man and mammalia.] *Arch. Mikrosk. Anat.* 97: 873-879. 1923.—Scrapings of tracheal epithelium of dog, cat, guinea pig, mouse, and man were stained in methylene blue, treated with aqueous condensed ammoniacal picric acid and mounted in 66% glycerin. Cells were found, never heretofore described, which were almost divided into 2 unequal parts and with each part crowned with a tuft of cilia. In the basal halves or less, one nucleus was retained which never showed any indications of mitosis. Some of these divisions resembled the budding processes found in hydroids. The nuclei of some of these cells, which appear to be in the course of amitosis, are of giant size. They might be considered double or triple cells. Similar cells may be bound together by their basal parts by short thin processes. It must be supposed that these arose by amitosis since these cells have no nuclei but the process serves as a bridge for transferring impulses and stimulation. On the other hand, the relationships of the fibrillae in other cells indicate that these may be true cell fusions. A description of the chondriosomes and their relations to the cilia is also given.—*H. C. Sands.*

3271. EMBERGER, L. Contribution à l'étude de la formation des plastes chez les végétaux. [Contribution to the study of the formation of plastids in plants.] *Compt. Rend. Acad. Sci. Paris*, 179: 420-422. Fig. 1-4. 1924.—Roots of the pillwort, leaves of *Scolopendrium*, bulb scales of the white lily, and stems of *Pellionia* show that the granular chondriosomes only, and not the chondriocontes, form starch. This confirms the views of Guilliermond and of Mangenot that there are 2 kinds of chondriosomes, the plastid-formers and the inactive mitochondria, and not one kind only as Meves maintained.—*C. H. Farr.*

3272. EMBERGER, L. Observations cytologique sur le bulbe de *Lilium candidum* L. (Cytological observations on the bulb of *Lilium candidum*.) *Compt. Rend. Acad. Sci. Paris* 179: 344-346. 1924.—It is stated that the bulb of the lily is never dormant. A study is made of the starch formation in this organ, and its origin from chondriosomes. Bulb scales of different ages are used.—*C. H. Farr.*

3273. ENTZ, G. Über die mitotische Teilung von *Ceratium hirundinella*. [The mitotic division of *Ceratium hirundinella*.] Arch. Protistenk. 43: 416-431. Pl. 13-14, 10 fig. 1921.—The chromatin of the resting nucleus occurs as small disconnected spheres; from 1 to 4 nucleoli may be present. In the prophase, these chromatin granules become grouped into parallel rows. Next, a vacuole appears in each chromatin granule; these vacuoles then enlarge so that their walls come in contact with each other to form a honeycomb network, with small granules lying in the node-points. These chromatin elements fuse into threads to form a "thread-skein." Later this thread-skein breaks up into longitudinally split segments of chromosomes; these split chromosome-segments then fuse end-to-end to form long, longitudinally-split chromosomes, which become arranged parallel to each other in the equatorial belt. In the metaphase these double chromosomes are divided transversely, a half of each pair being transmitted to each daughter nucleus. In the later stages of division, reconstruction of the daughter nuclei ensues, resulting in the production of typical resting nuclei.—R. P. Hall.

3274. FAUST, E. C. A study of trichomonas of the guinea-pig from Peking. Arch. Protistenk. 44: 115-118. Pl. 5, 1 fig. 1921.—*Trichomonas flagelliphora* Faust is discovered and described.—Harold Kirby.

3275. KLEINMANN, ANTON. Ueber Kern- und Zellteilungen in Cambium. [Nuclear and cell mitosis in the cambium.] Bot. Archiv. 4: 113-147. Pl. 1-7, fig. 1-17. 1923.—Tangential division is not restricted to a single row of cells in the cambium of dicotyledons. The cambium is, on the contrary, a layer of meristemic cells all of which are equally capable of tangential division. Horizontal division of cambial cells, which serves to increase the length of the cambium, does not occur sporadically, but all cells of any one story of the cambium cylinder divide within a short period of time. There does not appear to be a distinction between the dicotyledonous and the coniferous types.—William Seifriz.

3276. KRUGER, PAUL. Studien über Cirripeden. III. Die Zementdrüsen von Scalpellum. Über die Beteiligung des Zellkerns an der Sekretion. [Studies on Cirripedia. III. The cement glands of Scalpellum. Concerning the share of the cell nucleus in secretion.] Arch. Mikrosk. Anat. 97: 839-868. P. 34, fig. 1-2. 1923.—The cement glands of Cirripeden are always present in the larvae (*Metanauplius*). Although possessed by males, they probably do not function. They grow to unusual size in the females and especially in hemaphrodites. The chromatin in these nuclei is dispersed in the form of minute granules, through which an enormously greater surface is provided. Divisions never occur during the life of the cells and no change in the affinity of the chromatin for basic dyes has been noted. The manner of formation of the secretion granules in the embryo cells cannot be settled. At the time of the appearance of the secretion in the cell plasm the nuclear apparatus exhibits great activity as exhibited in multiplication of the number of nucleoli, and in changes in their form, structure and affinity for dyes. It can be shown that the nucleoli of the nucleus are constantly transported towards the side nearest the discharge duct; and that here they dissolve the nuclear membrane, and are passed into the cell plasm. This may lead to a complete transposition of the nucleus into nucleoli which arise *de novo*. The activity of the cell is periodic. The cement cells represent a strictly specialized group whose number is predetermined, and whose activity consists in the taking up of food stuffs and in the discharge of specific materials. At times these cells serve the functions of the organism; at other times they are secretory in nature. The nucleus alone is the agent of secretion. This secretory production appears first in the form of true nucleoli. These nucleoli, in the sense of Häcker's nuclear secretion theory, represent split products.—H. C. Sands.

3277. LEE, BEATRICE, AND J. H. PRIESTLEY. The plant cuticle. 1. Its structure, distribution and function. Ann. Bot. 38: 525-546. 12 fig. 1924.—The cuticle is formed from fatty substances which are invariably associated with the meristematic protoplast, and which migrate to the plasmatic interfaces during differentiation and thence along the walls to the surface. Evidence to this effect from its development in angiosperms is described. Microchemically it stains readily with fat stains, is very resistant to acid hydrolyzing agents and is readily oxidized by either acid or alkaline oxidizing agents. It forms a continuous layer over the cellulose epidermal wall, while beneath it the cellulose may be impregnated with fatty deposits. It is normally present on leaf and shoot of Bryophyta and of all vascular plants.

Peculiarities in its distribution and degree of development are reviewed. Its absence from the root is determined by differences in wall structure and development. The thickness of the layer is affected by external conditions. Thus, a rich supply of potassium tends to increase it whereas calcium tends to decrease it, because potassium soaps are relatively soluble and therefore mobile in the walls, while calcium soaps are insoluble. Light and humidity by their influence on oxidation and condensation of fatty acids affect the thickness and consistency of the cuticle. Since it is very resistant to stretching, the rate of condensation during development may affect the appearance of epidermal outgrowths such as hairs, and the form of palisade cells.—*W. P. Thompson.*

3278. LENOIR, MAURICE. *Le noyau de la cellule mère du sac embryonnaire chez le Fritillaria imperialis observé pendant son évolution prosynaptique.* [The nucleus of the macrospore mother cell of *Fritillaria imperialis* observed during its prosynaptic development.] *Compt. Rend. Acad. Sci. Paris* 179: 698–700. 1924.—A series of presynaptic phenomena here found, have not previously been reported. The chromatic granules are in a quasi-individual state and later disappear, with the coalescence of the anastomoses between them. Five stages of presynaptic development are described. During these periods the nuclei enlarge very considerably and rapidly, which seems also to be the case with the phenomena associated with the state of the nucleolus and the punctuation of the reticulum. Two phases in the development can be distinguished: In the 1st there is an alteration in the biochemical equilibrium of the nuclear sap by the mass invasion of the cytoplasm into the nucleus; in the 2nd phase the biochemical equilibrium is re-established by an intense reaction between the nucleolar and the so-called chromatin elements of the nucleus.—*C. H. Farr.*

3279. MANN, MARGARET C. A method of making permanent smears of pollen mother cells. *Science* 60: 548. 1924.—The contents of the anther is distributed with a scalpel over a film of albumen fixation on a slide. The slide is then immersed in the killing and fixing reagent, washed, stained and mounted permanently.—*C. J. Lyon.*

3280. MIRANDE, MARCEL. *Sur les états de la liliostérine au cours de la vie des écailles bulbaires du Lis blanc.* [The state of the liliosterin during the life of the bulb scales of the white lily.] *Compt. Rend. Acad. Sci. Paris* 179: 638–641. *Fig. 1–12.* 1924.—Sterinoplasts is the name given to certain organs which are the center for the deposition of a phytosterin (liliosterin) in a semi-fluid condition.—*C. H. Farr.*

3281. PARAT, M., ET J. PAINLEVÉ. *Constitution du cytoplasme d'une cellule glandulaire: la cellule des glandes salivaires de la larve du Chironome.* [Constitution of the cytoplasm of a glandular cell: the cell of the salivary glands of the larva of *Chironomus*.] *Compt. Rend. Acad. Sci. Paris* 179: 543–544. 1924.

3282. ROMIEU, MARC. *Essais microchimiques sur les granulations des leucocytes eosinophiles de l'homme.* [Microchemical analysis of the granulations of the eosin-staining leucocytes of man.] *Compt. Rend. Acad. Sci. Paris* 179: 579–581. 1924.

3283. SCHNEIDER, HANS. *Kern und Kernteilung bei Ceratium tripos.* [Nucleus and nuclear division in *Ceratium tripos*.] *Arch. Protistenk.* 48: 302–315. *Pl. 13, 4 fig.* 1924.—Nuclear structure and division are described for both *Ceratium tripos* var. *subsalsum* Ostenfeld and the form on which Borgert (1910–11) worked. Probably in the true resting nucleus of *Ceratium* there are chromatin granules, but generally one meets with nuclei with chromatin threads, the nucleus being in the interphase. At the beginning of division there is a synezyxis stage, as Borgert found, during which there is a pairing of chromatin threads. These double threads are transversely halved. A spindle does not appear, and there is no centriole. The reduction of the chromosome number by amitosis is not probable. Decision on this point of doubling and reduction of chromosomes is only to be reached through the study of sections.—*Harold Kirby.*

3284. SCHÜRHOFF, P. N. *Die plastiden.* [Plastids.] [In: LINSBAUER, K. *Handbuch der Pflanzenanatomie. Allgemeine Teil: Cytologie. Bd. 1.* iv + 225 p. 57 fig. Gebrüder Borntraeger: Berlin, 1924.—The author of this monograph discusses plastids under the following main subject headings: (1) Morphology (theories concerning the origin of plastids, their development and reproduction, the form and structure of the various types of plastids); (2) constituents of plastids; (3) physiology of plastids (changes in form and position, origin and decomposition, assimilation, transport and storage of assimilates); and (4) pathology of

plastids (abnormalities of form, chlorosis, metaplastic greening, variegation).—The literature list of 23 pages is followed by indexes of authors and of Latin plant names, and by a revision of Anthophyte names.—*Frederick V. Rand.*

3285. STRANGEWAYS, T. S. P. Observations on the formation of bi-nuclear cells. *Proc. Roy. Soc. London B* 96: 291-293. *Pl.* 4-5. 1924.—Binuclear cells in cultures of adult and embryo chicken tissues grown in vitro are often seen and can be induced by slightly unfavorable media, X-rays, etc. Continuous observation under oil immersion shows such cells to originate during telophase of otherwise normal mitosis. They may arise: (1) by incomplete constriction between the daughter nuclei, such constriction later disappearing; (2) by retention of both nuclei in 1 of the 2 masses of cytoplasm which separate by constriction; or (3) by failure of daughter nuclei to reorganize after division, thus giving 2 or 3 apparent nuclei in each daughter cell.—*P. B. Sears.*

3286. WAGNER, KARL. Zur Zytologie der Zwischenzellen des Hodens. [Cytology of the interstitial cells of testicles.] *Anat. Anzeiger* 56: 559-563. 1923.

3287. WALL, W. A., AND A. H. ROBERTSON. The use of domestic methylene blue in staining milk by the Breed method. *Jour. Bact.* 7: 307-308. 1922.—Methylene blue for staining is on the market in different forms: (1) the pure hydrochloride, sometimes known as "U. S. P." or "medicinally pure," which is both alcohol and water soluble; (2) the double zinc salt, which is alcohol but not water soluble; (3) mixtures of the 2 in various proportions. Methylene blue "for bacilli" may be any 1 of the 3 forms.—*C. E. Skinner.*

3288. WEISSENBERG, RICHARD. Weiter Studien über intrazellulären Parasitismus, Ein myxosporidienartiger Organismus als echter Zellparasit Malphigischen Körperschen der Hechtniere. [Further studies with regard to cell parasitism. A myxosporidian organism as a true cell parasite of the Malphigian tubes of cod kidney.] *Arch. Mikrosk. Anat.* 97: 431-480. 3 fig. 1923.—In the cells of the Malphigian tubes of the cod kidney, there lives, as a true cell parasite, a protozoan which causes a severe hypertrophy. After destruction of the cytoplasm of the host cells, their hypertrophied nuclei remain for a long time in the midst of the parasitic mass. Together with bordering kidney tissue and glomurella, the parasite becomes encapsulated to form a cyst. Fresh smears and fixation with osmic acid vapor show that the parasite consists of a soft jelly-like outer membrane and a thick plasma body which may slip out of the envelope. Parasites from mature cysts contain a small outer nucleus as well as 2 large inner nuclei; the latter, through an inner budding process, have built special cell limits. In favorable media, the naked plasma bodies show characteristic motion by which they swim with the aid of pseudopodia located on the anterior end. The construction and motion of the plasma bodies resemble the juvenile stages of Myxosporidia in which the outer nucleus is a somatic one and the 2 inner nuclei may be compared to the nuclei of generative cells. The author believes that the organism belongs to the single-spore-building type of Myxosporidia. Twin and sporulating-parasites were observed near the usual parasite, in which the individual plasmasome became enveloped by a 1-nucleate, soft envelope. The author supposes that the original envelope corresponds to the plasma body of the Myxosporidia, which, in accommodation to the endocellular life-form, has undergone a sharp reduction. The free swimming forms would possess the value of actively motile inner buddings which could be compared to the gemmules described by Davis in the case of *Sinuolinea dimorpha*. For the Myxosporidia in question, the endocellular development and reproduction period means an interesting bridge or inter-form to the constantly appearing parasitic forms of this family.—*H. C. Sands.*

ECOLOGY

GEO. D. FULLER, *Editor*

(See also in this issue Entries 3143, 3148, 3152, 3161, 3162, 3173, 3189, 3216, 3352, 3383, 3387, 3390, 3393, 3562, 3563, 3625, 3626, 3643, 3672, 3732, 3871, 3872, 3873, 3896, 3952, 3954, 3973, 3984, 3991)

GENERAL, FACTORS, MEASUREMENTS

3289. АЛЕХИН, В. [ALEKHIN, V.] Что такое растительное сообщество. Растительное сообщество, как выражение социальной жизни у растений. [What is a plant association?

The plant association, as an expression of social life in plants.] 76 p. Изд. М. С. Сабашниковых: Москва. М. & S. Sabashnikov: Moscow, 1924.—A plea is made for the study of plant associations as a branch of science apart from phytogeography or ecology. The structure, morphology and functions of associations may be considered. Such a study of plant associations has been largely worked out by Russian botanists and to it the term "phytosociology" was first applied by Kryloff in 1898. The author conceives the association as a species complex possessing a definite structure and composed of ecologically and phenologically different elements and presenting, in spite of its mobility, an entirely stable system (a mobile equilibrium). A mobility dependent upon meteorological conditions and another dependent upon animal influences are recognized and supported by detailed data on changes of flora in the vast "Streletzkaja Stepp" near Kursk and in the steppes of Ekaterinoslav province. The quantitative relation among the elements of a definite association is constant, forming a stable system. Stability is the principal sign of an association. If destroyed, an association will be reestablished if the elements are available. Some associations such as bogs, marshes and meadows are apparently stable but really unstable. Meadows produce an intrazonal, not a zonal vegetation. All associations in the same river valley may be arranged serially and the author arranges those of the River Zna (Tamboo Province) in an ascending grade of humidity in which the point of equilibrium is slowly but constantly displaced. The divisions of associations into "close" and "open" cannot be adopted.—V. Lashevsky.

3290. ALLEN, W. E. A quantitative and statistical study of the plankton of the San Joaquin River and its tributaries in and near Stockton, California, in 1913. Univ. California Publ. Zool. 22: 1-292. Pl. 1-12. 1920.—An account is given of the physical conditions of the San Joaquin River area and the resultant influences on plankton. Collections were made weekly at 2 stations, twice a week at one station, and daily and hourly at places for short periods. Material was preserved in formalin, measured volumetrically with the aid of a hand centrifuge, and counted with the Whipple ocular micrometer and the Sedgwick-Rafter counting cell. The plankton studied comprised blue-green algae, green algae, diatoms, flagellates, rhizopods, ciliates, rotifers and crustacea. The San Joaquin River supports abundant plankton at Stockton. Algae dominate in the river; animals dominate in the sewage laden Stockton Channel. There are seasonal fluctuations due to temperature with, at Stockton, an autumnal maximum. Daily records taken during a single lunar cycle seem to show that there is an increase in the green organisms with an increase of lunar light, a decrease as Entomostraca increase, and a subsequent partial recovery. There is also a fluctuation at different hours of the day.—Harold Kirby.

3291. AMANN, J. Les Muscinées et la réaction du substrat. [Bryophytes and the reaction of the substratum.] Rev. Bryologique 51: 34-37. 1924.—The author brings out the fact that the moss flora of a region is largely dependent on the chemical reaction of the substratum and distinguishes the following groups: species requiring acid substrata, species growing on acid or neutral substrata, species requiring neutral substrata, and species requiring alkaline substrata. The acidophilous mosses are mostly confined to substrata free from lime salts and the basiphilous mosses to substrata containing lime salts, but certain exceptions occur.—A. W. Evans.

3292. ATKINS, W. R. G., AND G. T. HARRIS. Seasonal changes in the water and heleoplankton of fresh-water ponds. Sci. Proc. Roy. Dublin Soc. 18: 1-21. 3 fig. 1924.—The seasonal changes in the heleoplankton of 2 fresh water ponds have been studied for 20 months and compared with alterations in the solutes. In each a vernal rise in alkalinity was followed by a period of stagnation. In Antony Pond this condition persisted till the autumn rains, in Staddon it was succeeded by high alkalinity lasting till October. These changes are associated with the spring increase in plankton, and the development of masses of floating algae in the 2nd pond. The electrical conductivity was high when the pH value was low, for removal of CO₂ results in precipitation of carbonates. In both ponds the supply of phosphate was exhausted in spring but in Staddon pond there was an inflow rich in phosphate. Phosphate increased again in winter partly by regeneration, partly by inflow of surface water. In ponds, as in the sea, lack of phosphate limits the production of plankton. The silica content of the

pond on the Staddon grits was always greater than that of Antony Pond on the Devonian slates. The seasonal changes are complex but if turbidity due to clay coincides with a high pH value, much silica, up to 8 parts per million, may be dissolved. Diatoms may have a small effect in reducing the amount of silica in solution. The rapid increase in plankton in spring is associated with increase in light rather than in temperature. The ponds studied have varied from pH 5.0 on Dartmoor to pH 9.4, and the electrical conductivity of natural fresh waters from $C \times 10^6 = 19$ to 300 at 0°C .—Notes are given on the abundance and the variations of many individual species.—*W. R. G. Atkins*.

3293. BERRY, S. STILLMAN. Observations on a Montana beaver canal. Ann. Rept. Smithsonian Inst. 1922: 297-308. Pl. 1-6. 1924.—Canal building by beavers is apparently stimulated by their partiality to the bark of various trees, especially the aspen (*Populus tremuloides*), for food. The subject of this paper is an unusually long and highly developed canal on the Musselshell River, Montana. The food tree in this instance was largely cottonwood, *Populus* sp.—*Neil Hotchkiss*.

3294. BUXTON, P. A. Heat, moisture and animal life in deserts. Proc. Roy. Soc. London B 96: 123-131. 1924.—The internal body temperature of insects living upon the desert surface is lower than the temperature of the desert surface, suggesting a source of moisture greater than commonly supposed for such insects. Certain highly hygroscopic plant fragments of unknown species were found which can absorb significant amounts (60%) of moisture from air of high humidity. The night air in deserts is often nearly or quite saturated. These shreds were found to contain 60.5% at 2 P.M., no rain having fallen for 2 months. Such shreds are believed to furnish water as well as food for insects and in turn for larger animals.—*P. B. Sears*.

3295. CLARK, J. EDMUND, IVAN D. MARGARY, AND RICHARD MARSHALL. (Phenological Committee of the Royal Meteorological Society.) International cooperation in phenological research. Nature 114: 607-608. 1924.—The history of the work in Europe is reviewed briefly and suggestions for wider cooperation are invited. A uniform and simplified method seems desirable, taking at first a very limited number of common plants. It is suggested that some one at each of the more important scientific institutions might be interested in making consecutive observations.—*O. A. Stevens*.

3296. COOPER, W. S. The battle of ice and forest. Amer. Forests and Forest Life 30: 195-198, 234. 10 fig. 1924.—This gives a non-technical description of the development of forest succession in relation to the advance and retreat of the many glaciers entering Glacial Bay, Alaska.—*Chas. H. Otis*.

3297. DOUGLASS, A. E. Some aspects of the use of the annual rings of trees in climatic study. Ann. Rept. Smithsonian Inst. 1922: 223-239. 1924.—Discussing the yearly identity of the rings, the number of trees studied and their relation to topography, the instruments used and the correlations made with sun spot cycles and historic records, the author concludes that very definite relations between climate and tree growth may be established. Data from the study of annual rings may be useful in interpreting the past and possibly in predicting the climatic variations of the future.—*Geo. D. Fuller*.

3298. DOVER, CEDRIC. The insect fauna of an Indian island. Nature 114: 351-352. 1 fig. 1924.—Reference is made to Barkuda Island in Chilka Lake on the east coast of India. A brief discussion of the flora is included.—*O. A. Stevens*.

3299. FRÖDIN, JOHN. La limite forestière alpine et la température de l'air. [The alpine timberline and air temperature.] Bot. Notiser 1920: 167-176. 1921.—The Scandinavian timberline is formed almost exclusively by *Betula pubescens* and is thought to be determined by the shade temperature of the air. It varies as local conditions affect the temperature rather than following general isothermal lines. An exact coincidence of isotherms and timberline obtains only in limited and homogeneous areas. Other factors of importance are soil moisture and soil nutrients. The timberline is higher along streams than elsewhere.—*Geo. D. Fuller*.

3300. HOPKINS, A. D. Notes on the bioclimatic law. Nature 114: 608-610. 1924.—This is in connection with the article on phenological research by CLARK ET AL. (See this issue, Entry 3295.) The bioclimatic law is stated briefly. A series of long time phenological ob-

servations from representative positions would be of much value in interpreting the law and in establishing bioclimatic zones which will indicate what crops can be grown.—*O. A. Stevens.*

3301. КАМИНСКИЙ, А. А. [KAMINSKI, A. A.] **Климатические области Восточной Европы.** [Climatic regions of Eastern Europe.] Труды по лесному опытному Делу в России. Bull. Forest. Exp. Res. Russia 64: 1-42. 1 pl. 1924.—In this comparison of climatic regions of Eastern Europe with forest distribution there are recognized thermic zones, schemes for the division of the surface of the earth into climatic regions, and meteorological factors which hinder the spread of forests in the north and south. Eastern Europe is divided into the following climatic regions: (1) Desert of Turkestan and Transcaspiia; (2) dry steppes of Turkestan and Turgai; (3) dry steppes of Ssemipalatinsk, Akmolinsk, Uralsk, North Turgar, the south parts of the provinces of Ssamara, Astrachan, Ekaterinoslaw and Taurien; (4) black-earth-steppes of European Russia; (5a) black-earth-steppes with sporadic forests; (5b) steppes with grey soil and sporadic forests; and (6) forest zone. These regions are mapped and relative humidity is expressed in various schemes.—*V. Lashevsky.*

3302. Коровин, Е. П. [KOROVIN, E. P.] **Растительные Формации Нуратинской Долины.** [Plant-formations of the Nour-Ataou Valley.] Trans. Sci. Soc. Turkestan 1: 43-77. 1 pl. 1923.—The Nour-Ataou Valley is limited at the north and south by branches of the Alai-system—the chains of Nour-Ataou and Ak-Taou. Its only opening is at the northwest where it communicates with the sandy Turkestan deserts. There, upon the intruding sands are communities of sand plants including a robust growth of *Ferula foetida*. In the upper part of the valley is an Iris formation, *Iris songorica* Sch. and some ephemerals. In the lower part of the valley we find a formation of *Artemisia maritima* and ephemerals. There is a list of species, a map of the vegetation and a description of 1 new species, *Astragalus pulcher* Eng. Kor.—*V. Lashevsky.*

3303. KÜHNHOLTZ-LORDAT, GEORGES. Contribution à l'étude des associations par le "relevé floristique." [Study of associations by a "floristic list."] Bull. Soc. Bot. France 69: 518-523. 2 fig. 1922.—A method is described of making a list of the species of an area, indicating the quantity and social relations of each and resulting in a rather accurate determination of the associations involved.—*P. A. Young.*

3304. LEMOINE, MME. PAUL. Sur la répartition des alques calcaires (Corallinacées) en profondeur, en Méditerranée. [The distribution of the coralline algae in depth in the Mediterranean Sea.] Compt. Rend. Acad. Sci. Paris 179: 201-203. 1924.—These algae with Bryozoa and other organisms make the formation known as "trotteurs" which previous studies have shown cover much of the depths from 30-60 m. Excluding fragile forms not readily recognized in dredgings, a difference was found in the distribution of the crustaceous and the arborescent Melobesiae independent of the genera to which they belong. The latter have a lower limit of 65-80 m. and an upper limit of 15 m. while the former extend from sea level to 80 m. *Lithothamnium Phillipi* is, however, found at 120 m. Comparisons are made with known distribution in the British Channel and of light and temperature conditions.—*C. H. Farr.*

3305. MURPHY, R. C. The marine ornithology of the Cape Verde Islands, with a list of all the birds of the archipelago. Bull. Amer. Mus. Nat. Hist. 50: 211-278. 10 fig. 1924.—There is a description of the climatic and other environmental features of the islands.—*Frank E. Lutz.*

3306. PEARSON, G. A. Natural reproduction of western yellow pine in the southwest. U. S. Dept. Agric. Dept. Bull. 1105. 1-143. Pl. 1-22, fig. 1-16. 1923.—This is a very complete study of the reproduction of *Pinus ponderosa* on sample plots under controlled conditions in the Coconino and Tusayan National Forests in northern Arizona, U. S. A. The factors considered are seed supply, climate, soil, herbaceous vegetation, cutting, brush dispersal, grazing and miscellaneous enemies. Considerable data on temperature and on soil moisture related to the wilting coefficient are also given. Sandy and gravelly soils seem favorable to reproduction. Root competition for soil moisture greatly retards the growth of seedlings. Rodents seem to destroy all seed except during the most favorable years and grazing by sheep is usually distinctly harmful. As a result of these studies certain rules are formulated to promote reproduction in the forests of this region, among which are injunctions not to over-

graze for several years before cutting, to cut clean with the exception of the necessary 4 large seed trees per acre, to burn the brush where tall grass or other rich ground-cover occurs and to keep out fires.—*Geo. D. Fuller.*

3307. ROMELL, LARS-GUNNAR. *L'aération du sol.* [Aeration of the soil.] *Rev. Internat. Renseign. Agricoles* N.S. 1: 299-315. 1922.—The author discusses the importance of soil aeration and regards "normal aeration" as the complete change of the air contained in the superficial 20 cm. of soil once per hour. Examining the effects of temperature, atmospheric pressure, water, wind and diffusion upon the gas exchange he shows that diffusion only is efficient. The most serious obstacle to aeration is excess of water, and its removal by drainage is usually a sufficient remedy for insufficient aeration.—*Geo. D. Fuller.*

3308. SLADDEN, B. *Karewa: an island sanctuary.* *New Zealand Jour. Sci. and Tech.* 7: 182-187. 3 fig. 1924.—The Karewa Islet lies near the entrance of Tauranga Harbour, Bay of Plenty, New Zealand, and is 0.5 ha. in area. The latter part of the paper gives a brief account of the vegetation, a natural shrubbery with *Cosprosmas Baueri* dominant.—*H. H. Allan.*

3309. TENGWALL, T. Å. *Eine Antwort an John Frödin.* [An answer to John Frödin.] *Bot. Notiser* 1921: 223-235. 1921.—This is a criticism of Frödin's article on the alpine timberline in Scandinavia (see this issue Entry 3299), which holds that there are no good grounds for Frödin's theories.—*P. A. Rydberg.*

3310. WARD, F. KINGDON. *The mystery rivers of Thibet: a description of the little known land where Asias' mightiest rivers gallop in harness through the narrow gateway of Thibet; its peoples, fauna and flora.* 316 p., 16 pl., 4 maps. Seeley, Service & Co.: London, 1923.—This is an account of the author's travels and has some notes on the vegetation. Incidental descriptions are given of species of *Rhododendron*, *Primula*, *Potentilla*, *Meconopsis* and *Gentiana*.—*Geo. D. Fuller.*

3311. WEEVERS, TH. *On the calcifuge plants of the inland dunes of the island of Goeree.* *K. Akad. van Wetenschappen te Amsterdam Proc. Sect. Sci.* 23: 475-480. 1920.—*Sarothamnus vulgaris* Wimm. occurs in this island within a sharply defined area and this occurrence is explained on the hypothesis of the antagonism of various salts present in the soil.—*Geo. D. Fuller.*

VEGETATION

3312. BOUILLENNE, RAY. *La région des Furos.* [The region of the "Furos."] *Bull. Soc. Roy. Bot. Belgique* 57: 19-27. 1 pl. 1924.—The "Furos" are narrow channels between recently deposited islands at the head of the delta of the Amazon. The greater part of these islands are submerged twice daily by the tides although much of the water is scarcely brackish. Zones of vegetation are described consisting of associations of: (1) mangroves, species of *Rhizophora*, *Avicennia* and *Laguncularia* being present, with the continuity of the zone occasionally broken by stands of a large aroid, *Montrichardia arborescens*, and by floating prairies; (2) palms among which *Mauritia flexuosa* is dominant and (3) forests of *Cecropia* spp. draped with lianas of *Bougainvillea* and *Dalbergia*. This vegetation is important in stabilizing and promoting the growth of these alluvial islands, the largest of which have portions never inundated and bearing a tropical rain forest in which *Ciba pentandra*, *Hymenaea courbaril*, *Parkia pendula* and *Hevea brasiliensis* are conspicuous trees.—*Geo. D. Fuller.*

3313. FRÖDIN, JOHN. *Recherches sur la végétation du Haut Atlas.* [The vegetation of the high Atlas.] *Lunds. Univ. Arsskrift. N. F. Avd. 2.* 19^o: 1-24. Fig. 1-7. 1923.—On the plains of low elevation near the city of Morocco one of the chief associations is that of the dwarf palm, *Chamaerops humilis*, attaining a height of 1 m. and covering $\frac{1}{2}$ the surface. The higher plain of Haouz has a steppe vegetation with associations in the north characterized by *Zizyphus lotus*, *Centaurea maroccana*, and *Asphodelus tenuifolius*, while towards the south there are associations of *Launaea arborescens*, *Artemisia herba* and *Stipa tortilis*, the last frequently associated with *Acacia gummifera*. The limit between the steppes of Haouz and the forests of the mountain slopes is at 1000-1200 m. The forest is dominated by *Quercus Ilex* and varies much in density and height often being reduced to mere scrub. Mingling in it is *Pinus halepensis*, occasionally replaced by *Juniperus oxycedrus* and *J. phoenicea*. In places, especially on south slopes, the forest gives way to associations of *Lavandula*, *Thymus*, *Cistus*

and occasionally to a shrub association characterized by *Pistacia lentiscus*. Near Demnat an interesting association is dominated by the cactoid *Euphorbia resinifera*. The relationships of the associations are discussed and lists of species are given.—*Geo. D. Fuller*.

3314. GATES, FRANK C. The persistency of *Scirpus validus* Vahl. *Amer. Jour. Bot.* 11: 513-517. 2 fig. 1924.—Thorough drainage of swales of *Scirpus validus* in northern Illinois resulted in greatly accelerating normal succession to land-plant associations, in which some plants of this species remain as relicts. Where the drained soil is disturbed, a number of common weeds come in, notably *Erigeron canadensis* and *Salsola pestifer*. At least 4 years of living under dry-land conditions has not been sufficient to eliminate plants of *Scirpus validus*.—*E. W. Sinnott*.

3315. КУЛЬТИАСОВ, М. В. [KULTIASOV, M. V.] Очерк растительности гор Пистали-тау. [Outline of the Pistali-tau mountains vegetation.] *Trans. Sci. Soc. Turkestan* 1: 89-107. 1923.—Pistali-tau is a mountain ridge of grey limestone some 250 m. high extending in a northwest southeast direction in Samarkand between 24.5°-33° N. Lat. and 67°-68° E. Long. The soft slopes and little "oases" are covered with dense grass-sedge associations, the plants being closely interrelated. On the stony slopes each crack has its own "flora," largely of thick-rooted xerophytes, but this area is becoming more restricted with the weathering of the rocks. Due to man's influence, shrubs of *Pistacia vera* L. once abundant are now few, small and disappearing. The name of the mountain is from the same root as that of *Pistacia*.—*V. Lashevsky*.

3316. LANG, HERBERT. Into the interior of British Guiana. *Nat. Hist.* 24: 467-478. 14 fig. 1924.—This contains a general description of the rain forests of the region.—*Geo. D. Fuller*.

3317. MAIRE, RENÉ. La végétation alpine du Grand Atlas marocain. [The alpine vegetation of the Grand Atlas Mountains of Morocco.] *Compt. Rend. Acad. Sci. Paris* 179: 489-493. 1924.—The author gives a résumé of the results of expeditions in 1921, 1922 and 1923, the first 2 of which he personally attended. The alpine vegetation begins on the north side at 300-3150 m. and is entirely of herbs and under-shrubs. Five groups of associations are described: the bare (écorches) pastures; the mobile fallen (éboulis) ground; the firm alpine turf; the brook associations and the rock associations. A number of associations are named under each group, together with some of the characteristic species.—*C. H. Farr*.

3318. NAVEZ, A. La forêt équatoriale brésilienne. [The equatorial forests of Brazil.] *Bull. Soc. Roy. Bot. Belgique* 57: 7-17. Pl. 1, 9 fig. 1924.—The conditions of temperature and of rainfall in the Rio de Janeiro region are presented graphically, the mean maximum temperature varying from 21.5-27.5°C. and the minimum from 18.5-24.5°C., and the annual precipitation from 113-355 cm. The structure of various types of trees with buttressed bases and that of various lianas is considered.—*Geo. D. Fuller*.

3319. WILLE, N. Karplanter og ferskvandsalger fra øerne Husøy, Ona og Røsholmen paa Nordmør. [Vascular plants and freshwater algæ from the Husøy, Ona and Røsholmen Islands in Nordmør.] *Nyt Mag. Naturvidensk. [Kristiania]* 61: 53-59. Pl. 1-2. 1922.—Husøy is situated about 28 miles north northwest of Molde, in the Atlantic Ocean at 62°51' N. Lat. The rocks are gneiss and crystalline limestones, the latter probably enriching the soil. The peaty soil is not confined to that formed from *Sphagnum* in moors. The climate is typically Atlantic, its temperature being, maximum 24.1°C., minimum -12.1°, annual mean 6.6°, coldest month (February) 2.0° and warmest month (August) 12.1°C. The rainfall is moderate but the humidity is great. The low islands are storm beaten with few calm days and the salt spray is driven well across the islands. The communities of the beaches, the seashore meadows, the rocky shores, the rocks and glens, the natural meadows and the lichen heath are discussed, as well as those of 2 farms.—*K. Munster Strøm*.

FLORISTICS

3320. COCKERELL, T. D. A. A bee collecting trip to Chimney Rock, Wyoming. *Entomol. News.* 35: 347-351. 1924.—This includes records of flowers visited and a short list of plants characteristic of the locality.—*O. A. Stevens*.

3321. FISHER, G. CLYDE. Alpine wild flowers of Arctic Lapland. *Nat. Hist.* 24: 659-

664. 6 pl., 8 fig. 1924.—The alpine flora is briefly described and illustrated by reproductions of excellent photographs.—*Geo. D. Fuller.*

3322. IRMSCHER, EDGAR. Pflanzenverbreitung und Entwicklung der Kontinente. Studien zur genetischen Pflanzengeographie. [Plant distribution and development of continents. Studies in genetic plant geography.] Mittel. Inst. Allg. Bot. Hamburg 5: 17-235. 33 fig. 1922 [1923].—The development of the continents and islands according to the displacement theory of Wegener is first traced. The tropical and southern fossil flora is then considered in view of this theory. As fossils are distributed according to the climatic zones that existed while they were living organisms they alone can harmonize otherwise contradictory facts of distribution. Both the fossil and present day flora of South America are described in some detail. The principal features of the geographical distribution of 289 families of flowering plants are discussed. Only 61 of these families are restricted to 1 continent, the others having species common to 2 or more. The "disconnected areas" of the various families are tabulated and some transition stages are pointed out. The propagation ratio of flowering plants is of much significance in the displacement theory. The author states that the acceptance of polar migration and the resultant delimitation of climatic zones is necessary for the understanding of dissemination of plants.—*M. B. Morgan.*

3323. KRAMER, F. De vindplaatsen van sandelhout (*Santalum album* L.) op Java. [The distribution of sandalwood in Java.] (With a summary in English.) Tectona 15: 731-762. Fig. 38-40. 1922.—*Santalum album* L. is found in Java from sea level to 1200 m. altitude in regions with a pronounced dry monsoon. A detailed description of the habitats together with an account of some researches in cultivation is given.—*Charles Coster.*

3324. NITSCHKE, RICHARD. Die geographische Verbreitung der Gattung *Acalypha*. [Geographical distribution of *Acalypha*.] Bot. Archiv. 4: 277-317. Pl. 1. 1923.—The following subseries are recognized: (1) *Pleurostachyae-Hypandrae* occurring in East and South Africa and Madagascar; (2) *Pantogynae-Pleurogynae* in the monsoon region, Central and South America, with 7 spp. in Madagascar and 3 in Africa; (3) *Pantogynae-Acrogynae* chiefly in Africa, Central and South America; (4) *Oligogynae* in Africa, Madagascar, tropical America including arid Central America and the Andes and as scattered individuals in India and the monsoon regions; (5) *Polygynae-Pleurogynae* with few widely scattered species in Africa and East Asia; (6) *Polygynae-Acrogynae* chiefly in Central and South America with several species in the Galapagos Islands and 2 in Madagascar and; (7) *Acrostachyae* only in arid Central America and Tropical America.—*William Seifriz.*

3325. ПОПОВ, М. Г. [POPOV, M. G.] флора пестроцветных толщ (краснопесчанниковых низкогорий) Бухары. [Flora of vari-colored beds (of the red-sandstone hills) of Boukharie.] Trans. Sci. Soc. Turkestan 1: 3-41. Pl. 1-6. 1923.—South Turkestan, centering about Iran, is regarded as the home of an extremely xerophytic and primitive flora forming open associations. The flora of the red sandstone mountains and hills is simply a complex of xerophytic forms showing no social groups. This flora is separated from the general vegetation of South Turkestan because of the number of species that are either relic endemics or that have very disjunctive areas of distribution. The flora of the vari-colored beds of Boukharie, aside from certain unique and isolated forms, shows affinities 1st with Pro-Asian and 2nd with Pro-African floras. Of the 68 spp. characteristic of these red sandstone hills, 35 are endemic, 14 are nearly so and 19 are spread over the limits of central Boukharie. The following new genera and species are described: *Sprygina* M. Pop. n. gen. (Cruciferae), *Sisimbrium heterophyllum* M. Pop. n. sp., *Haplophyllum dubium* Eug. Kor. n. sp., *Astragalus Kelleri* M. Pop. n. sp., *Euphorbia densiuscula* M. Pop. n. sp., *E. sogdiana* M. Pop. n. sp., *Cephalorhizum* M. Pop. et Eug. Kor. n. gen. (Plumbaginaceae), *Salvia Bucharica* M. Pop. n. sp., and *Pyrethrum Galae* M. Pop. n. sp.—*V. Lashevsky.*

3326. ST. JOHN, HAROLD. Sable Island, with a catalogue of its vascular plants. Proc. Boston Soc. Nat. Hist. 36: 1-103. Pl. 1-2. 1921.—Sable Island is a long crescentic island of sand dunes, 150 miles east of Halifax, Nova Scotia. In 1777 its size was 30 × 2 miles, in 1913, when visited by the author, it was 20 × 1 miles and apparently still decreasing in size. The climate is characterized by a rainfall of about 46 inches rather evenly distributed, rather low even temperature, frequent fogs and high winds. It has a scanty beach vegetation; the

sand dunes are sparsely covered by an association in which *Ammophila breviligulata*, *Lathyrus maritimus* and *Solidago sempervirens* are dominant with a few associates and in the most sheltered situations the *Empetrum* heaths appear characterized by *Empetrum nigrum*, *Juniperus communis* var. *megistocarpa*, *J. horizontalis*, *Pyrus arbutifolia* var. *atropurpurea* and *Vaccinium pennsylvanicum*. Fresh water ponds occur. No native trees occur and rather extensive planting has resulted in the survival of a very few low, wind-beaten specimens. The vascular flora consists of 147 spp. of which 45 are boreal, 83 south-western, 10 endemic and 8 of undetermined affinity. The following are new: *Juniperus communis* L. var. *megistocarpa* Fernald & St. John, *Juncus pelocarpus* Mey. var. *sabulonensis* St. John, *Calopogon pulchellus* (Sw) R. Br. f. *latifolius* St. John, *Polygonum hydropiperoides* Michx. var. *psilostachyum* St. John, *Rubus arcuans* Fernald & St. John, *Lathyrus palustris* L. var. *retusus* Fernald & St. John, *Bartonia iodandra* Robinson var. *sabulonensis* Fernald, *Lycopus uniflorus* Michx. var. *ovatus* Fernald & St. John, and *Agalinis paupercula* (Gray) Britton var. *neoscotica* (Greene) Pennell & St. John. An annotated list of species and a bibliography of 42 titles are appended.—*Geo. D. Fuller.*

3327. SCHONLAND, S. On the theory of "Age and Area." *Ann. Bot.* 38: 253-272. 1924. —The causes or conditions which vary the "age and area" rule, such as human activities, barriers, climatic changes, etc., are reviewed with illustrations from South Africa. Data with respect to African endemic genera and species and those with discontinuous distributions, are held to prove the theory useless. The distribution in Africa of the numerous species of *Erica* and related genera is analyzed in some detail and will not fit any such mechanical rule. For example, on the basis of the theory, the genus must have entered or originated in Africa at some point in Southwest Cape Colony, a conclusion which the author regards as absurd. The general conclusion is that in those cases in which the theory appears to be applicable, it resolves itself into the platitude that of 2 species equally endowed in the struggle for existence, the older will have a better chance under equal conditions to occupy a larger area; but since 2 species can hardly ever be so equally balanced and since really equal conditions can never be met with in their migrations, the result in the most favorable cases can only approximately fulfil the prediction of the theory.—*W. P. Thompson.*

3328. SKÄRMAN, J. A. O. Bidrag till nordöstra Västergötlands flora. [Flora of north-eastern Västergötland (province in Sweden).] *Svensk. Bot. Tidskr.* 18: 204-278. 9 fig. 1924. —A list of plants from this part of the province is given including the glacial relicts, *Betula nana* L., *Salix depressa* L., *S. phylicifolia* L., *Juncus stygius* L., *Luzula sudetica* DC. and *Carex livida* Willd. A note is given on *Cardamine amara* L. var. *aequiloba* which in Swden is known only from this district—*O. Heilborn.*

FORESTRY

W. N. SPARHAWK, *Editor*

(See also in this issue Entries 3161, 3162, 3220, 3240, 3252, 3296, 3297, 3299, 3301, 3306, 3309, 3312, 3313, 3316, 3318, 3323, 3508, 3643, 3705, 3739, 3754, 3758, 3767, 3801, 3818, 3819, 3895, 3995)

3329. ANONYMOUS. Causes of fires in logging operations. *Timberman* 26¹: 61-62. 1924. —Cigarettes and blasting are charged with causing most of the fires in logging operations. The use of an electric battery instead of fuse and matches for blasting choker holes is suggested.—*Duncan Dunning.*

3330. ANONYMOUS. Consideraciones tendentes a corregir la mala explotacion de resina hecha en Mexico. [Reasons for improving the wasteful exploitation of resin in Mexico.] *México Forest.* 2: 98-104. 3 pl. 1924.

3331. ANONYMOUS. Evaluation expérimentale de la production ligneuse des diverses espèces d'arbres. [Experimental determination of woody growth in several species of trees.] *Bull. Soc. Hist. Nat. Toulouse* 50: 331-334. 1922.—Results are given of measurements of growth and yield of chestnut, spruce, and pine.—*Neil Hotchkiss.*

3332. ANONYMOUS. Permanent program of the conference on the utilization of forest products. *Science* 60: 520. 1924.

3333. ANONYMOUS. Slash disposal for fire prevention. *Timberman* 26¹: 55. 1924.

3334. ВСЕРОССИЙСКИЙ Кооперативный Лесной Союз. [ALL-RUSSIAN COOPERATIVE FOREST UNION.] Материалы Всероссийского совещания кооперативных организаций, занятых сухой перегонкой дерева. 12-14 октября 1921. [Proceedings of the All-Russian Conference of cooperative organizations concerned with the dry distillation of wood.] 107 p. Москва [Moscow], 1921.—A paper by A. TARASOV (pp. 5-17) discusses the production of wood chemicals in Russia and the part played by cooperatives in the industry.—*W. N. Sparhawk*.

3335. ALLEN, E. T. Forestry investigations useful to loggers. *Timberman* 26¹: 70-71, 74. 1924.—This is a discussion of investigations needed to determine the facts upon which to base a policy for the disposition of private cut-over land.—*Duncan Dunning*.

3336. ALTONA, T. De djatibosschen (*Tectona grandis* L. f.) van den Bismarck-archipel. [Teak forests in the Bismarck Archipelago.] (With a summary in English.) *Tectona* 15: 862-869. Pl. 41. 1922.—It is believed that teak was introduced onto the islands, probably by Hindoos.—*Charles Coster*.

3337. ALTONA, T. Djati en Hindoes (Teak and Hindoes). [Origin of teak in Bodjonegoro, Java.] (With a summary in English.) *Tectona* 15: 458-507. Fig. 23-31. 1922.—Most of the *Tectona grandis* L. f. forests in the Bodjonegoro district show a regular spacing, and contain *Butea monosperma* Taub. and *Schleichera trijuga* Willd., while other species of trees are not common in the mixture. The author believes that teak was brought into Java from India by the Hindoos and largely cultivated between 1300 and 1500 A.D. (See also Bot. Absts. 13, Entry 7601.)—*Charles Coster*.

3338. ASHE, W. W. Reducing the cut of lower grade hardwood lumber. *Lumber World Rev.* 46⁶: 25-26. 1924.—Operators in old growth hardwoods can profitably reduce the proportion of low grade lumber produced by leaving trees below 18 inches in diameter. Small trees yield only low grade material and cost more to log and manufacture into lumber than larger trees. The price of their product is kept down by competition of 2nd growth which is usually situated closer to markets. If left, these small trees will form the basis for a profitable 2nd cut at an earlier period than is possible after the usual clear cutting.—*C. E. Behre*.

3339. BECKING, J. H., L. G. DEN BERGER, EN W. H. MEINDERSMA. Vloed- of mangrove bosschen in Ned.-Indië. [Dutch East Indian mangrove swamps.] (With a summary in English.) *Tectona* 15: 561-611. Fig. 33-35. 1922.—In addition to descriptions of the principal trees and the structure of their wood, with keys for identification, tables show rates of diameter growth and yields of timber, fuel wood, and tan bark. A bibliography is included.—*Charles Coster*.

3340. BERGER, L. G. DEN. Determinetabel van de voornaamste handelshoutsoorten van Malakka volgens het hout. [Key to the wood of the principal commercial timbers of the Malay Peninsula.] [Rev. of: FOXWORTHY, F. W. Commercial woods of the Malay Peninsula. *Malayan Forest Rec.* 1: 1-150. 1921 (see Bot. Absts. 13, Entry 127).] (With a summary in English.) *Tectona* 15: 305-321. 1922.—Foxworthy's key is said to be incorrect in several points, and the descriptions of woods are inadequate for their recognition. A new key is given by the reviewer.—*Charles Coster*.

3341. BERINGER, KARL. Die Maschine im Forstbetrieb. [Use of machinery in forestry.] *Forstwiss. Centralbl.* 46: 565-596. 1924.—The use of motor equipment for hauling, loading, preparing the soil, and other forest operations is still in the experimental stage in German forests, but will become more general as improved types of machines are developed.—*W. N. Sparhawk*.

3342. BEUMEE, J. G. B. Uitkomsten van de heropname van een veertigtal perken van het dunnings- en opbrengstonderzoek voor den djati (*Tectona grandis* L. f.). [Remeasurement of sample plots in the study of thinning and yield of teak plantations.] (With a summary in English) *Tectona* 15: 1-76. 1922.—The remeasurement of 40 sample plots in Java gave the following preliminary results: In forests of good quality a heavy thinning of the subordinate trees results in a higher rate of volume increment than a light thinning. In forests of the 3rd quality class or lower, a moderate or light thinning gives better results. A light thinning

of the dominant trees affects the growth of those remaining in the same way as a heavy thinning of subordinate trees. A sudden, heavy, partial clearance stimulates growth to such an extent that the small and large trees increase in diameter at about the same rate.—*Charles Coster*.

3343. BORNEBUSCH, T., AND S. RIX. Askemellemskoven paa Hardenberg. [The ash coppice-with-standards forest at Hardenberg.] Dansk Skovfor. Tidsskr. 9: 337-367. Pl. 1-10. 1924.—The treatment of this Danish forest from its establishment to the present time is sketched. The ash of best form is found in mixture with trees giving denser shade. Unlike similar forests in France, the understory does not contribute to volume production, as it is saved to protect the soil, keep out grass, and insure a future stand. Most of the trees belong to the top story, instead of being evenly divided in 3 stories. The higher price obtained for well formed trees determines the value of this method.—*W. H. Meyer*.

3344. BOYCE, JOHN S. Decay in Douglas fir in relation to cruising. Timberman 26¹: 51-54. Fig. 1-10. 1924.—Sporophores and fire scars are reliable indications of decay. Many large dead limbs and groups of radiating limbs do not necessarily indicate decay in Douglas fir. Red brown butt rot (*Polyporus schweinitzii*) is best indicated by fire scars or swollen butts. Culling 8 feet of the 1st log is a sufficient average allowance for this defect. Yellow brown top rot (*Fomes roseus*) is difficult to detect because of its position, but the loss caused by it is small. Brown trunk rot (*Fomes laricis*) is difficult to estimate. Sporophores are rare but when present usually indicate extensive decay. Sporophores of the conk rot (*Trametes pini*) or swollen knots, the initial stage in the manifestation of sporophores, occur in all but a very small percentage of affected trees. As a rule, 8 feet in each direction from a sporophore or swollen knot should be culled. Field glasses and a volume table based on diameter and height, giving the volume of each 32 foot log, assist in estimating decay.—*Duncan Dunning*.

3345. BURGER, D. Casuarina montana Miq. beschadigd door brand. [Casuarina montana Miq. damaged by fire.] Tectona 15: 152-153. Fig. 8. 1922.—Most of the trees of this species in the Tengger mountains of East Java are fire-scarred at the base.—*Charles Coster*.

3346. BUSSE. [Rev. of: KALBHENN, KONRAD. Die bewegung der Holzpreise in Deutschland vom Ende des Weltkrieges bis Herbst 1923. (Movement of timber prices in Germany from the end of the World War to Autumn, 1923.) 110 p. 17 pl. J. Neumann: Neudamm, 1924.] Deutsch. Forstzeitg. 39: 1106-1109. 1924.

3347. CHIEN, S. S. [Types of forest and their distribution.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 8: 130-144. 1923.—The characteristics, distribution, and environmental factors of tropical, deciduous, and evergreen forests are discussed.—*Chunjen C. Chen*.

3348. DEVENTER, A. J. VAN. Opbrengstcijfers uit de djatihoutvesterijen op Java. [Production of teak in the intensively managed forests of Java.] (With a summary in English.) Tectona 16: 7-39. 1923.—This is a statistical study of the relation between transportation facilities and the production of the better classes of timber in the separate divisions of intensively managed forests. The conversion of the extensively devastated primeval forests into systematically managed and protected forests was profitable from the start.—*Charles Coster*.

3349. DRUMMIE, A. C. Practical forestry from a workman's point of view. xii + 340 p. 40 fig. George Routledge & Sons. Ltd.: London, 1924.—This book, intended as "a practical reference book to beginners or young assistant foresters," deals with forestry operations on English estates.—*W. N. Sparhawk*.

3350. DUYFFES, J. J. Een kijk in vogelvlucht op het boschbeheer op Java 1911-1920. [A bird's-eye view of forest management in Java, 1911-1920.] (With a summary in English.) Tectona 16: 1-6. 1923.

3351. ECKSTEIN, K. Im Gefolge der Eule. [Following the owl moth.] Deutsch. Forstzeitg. 39: 1121-1123. 1924.—Stands of *Pinus silvestris* which have been attacked by the owl moth (*Noctua piniperda*) are threatened with serious damage by a weevil (*Pissodes notatus*) which kills trees 3-15 years old. Methods of control are suggested.—*W. N. Sparhawk*.

3352. FLAUGÈRE, A. Les forêts dans le Gard. [The forests of the Department of Gard.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 372-382. 1924.—

This department lies between the mountainous region of the Cévennes, the Rhône, and the Mediterranean, with an altitudinal range of 0-1567 m. The zone nearest the sea has only occasional small groups of live oak and pine. The middle zone, up to 400 m., is characterized by live oak, which almost exclusively dominates the forests. Summer drought is the controlling factor in their development. Handled as simple coppice, the forests in 20 years produce 2,000 kgm. of tan bark, 20 steres of fire wood, and 2,000 kgm. of fagots to the ha. On limestone soils within this zone, the forest has given way to brush, as a result of abuse. In the state forest of Valbonne a live oak and a beech were found close together, each about 100 years old and nearly 1 m. in diameter. From 400 to 800 m., chestnut predominates; above 800 m., beech is the dominant tree. Plantations of pines, spruce, and larch cover 13,000 hectares of the higher mountain slopes. Some of these are ready to be cut, and are expected to yield at the rate of 2 cu. m. annually to the ha. The value of the forest for recreation is also discussed.—*J. Kittredge, Jr.*

3353. GUINAUDEAU, A. Excursion. [Field trip to the forest of Moyeuivre.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 354-357. 1924.—This forest contains 70% beech and hornbeam, 10% oak and 20% other species. The annual yield is at the rate of 3.7 cu. m. per ha. A pure stand of beech, 50 years old, cut clean, yielded 400 cu. m. worth 24,000 francs, to the ha. In 1923, the forest income averaged 294 francs and the expenses 38 francs per ha.—*J. Kittredge, Jr.*

3354. GUYOT, H. Esquisse des régions géologiques qui constituent le Département de La Moselle. [Sketch of the geological regions in the Department of Moselle.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 309-326. 2 maps. 1924.—For the Metz and Moselle River regions of Lorraine, the relations of the geological formations to topography and forest distribution are analyzed, with a brief statement of the extent and character of forest and the rate of growth for each formation. That part of Lorraine changing hands in the World War has 156,805 hectares of forest, or 25.2% of the land area. About $\frac{1}{2}$ of the forest is owned by the state. Deciduous growth, chiefly oak and beech, covers $\frac{2}{3}$ of the area, and fir and pine about $\frac{1}{3}$. The maximum annual growth is 5.8 cu. m. to the ha., near Dabo.—*J. Kittredge, Jr.*

3355. GUYOT, H. Excursion du 9 Juillet 1924 à Abreschwiller-Walscheid-Dabo. [Field trip to the forests of Abreschwiller-Walscheid-Dabo.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 358-363. Pl. 2. 1924.—The communal forest of Abreschwiller contains 33% fir, 37% beech, 22% Scotch pine, and 8% spruce, oak and others; that of Walscheid is composed of 65% fir, and 35% beech. Beech predominates between 200 and 500 m., and fir up to 890 m. Spruce and Scotch pine reach 850 m. Pine thrives and reproduces itself naturally up to 600 m. The annual growth in the 2 forests averages 6.6 cu. m. per ha. with a net money yield of 400 francs.—*J. Kittredge, Jr.*

3356. HOLTEN, J. Laerkestudier i Udlandet. [Studies of larch of other countries.] Dansk Skovfor. Tidsskr. 9: 45-62. Pl. 1-5. 1924.—The most northern occurrence of larch is in Sweden at 62 $\frac{1}{2}$ °. A number of good stands in that country and in Norway are described. There are excellent stands in Silesia. Larch develops a deep root system where surface water is lacking or where surface competition is present. In shallow soil, red spruce will outgrow and suppress larch.—*W. H. Meyer.*

3357. HUFFEL, G. Les droits d'usage forestiers du Comté de Dabo. [The rights of forest use in the county of Dabo.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 326-341. 1924.—The history of this district in the lower Vosges Mountains since the Roman occupation, is outlined, with especial regard to the use of the forests by the local inhabitants. The forests now contain 80% fir, 15% beech, and 5% pine. The law of 1905 grants to the local inhabitants free use of dead wood or wood for construction and repair of their buildings, and the right to obtain wood for local industries and for fuel at a price fixed by the State. Each head of a family is to receive annually 8 fir trees, at least 40 cm. in diameter at 5 feet above the ground. The local communities have the right to pre-empt all fuel wood placed on sale in their territory, and all wind thrown timber, at a price of 1.6-4 marks per cord. Free pasture is allowed, under the regulations of the forest administration.—*J. Kittredge, Jr.*

3358. JELSTRUP, HENRIK JACOB. Innberetning om det norske skogvesen og endel under landbrucksdepartementets skogkontor hørende anliggender for Kalendar-året 1923. [Report of the Norwegian Forest Service for the calendar year 1923.] (2) + 93 p. Kristiania. 1924.—This report by the director of Norwegian forests covers personnel, quarters, budget, income and expenses of each forest, survey and boundary work, methods of treatment of individual forests, damage by various agencies, forest planting, abundance of seed, lumber cut, prices of products, technical instruction, hunting, and fire. During the year, 83 fires burned over 228 ha.—*W. H. Meyer.*

3359. JENSEN, P. B. Undersøgelser over Stoffproduktion i Skov. [Investigations on wood production in a forest.] Dansk Skovfor. Tidsskr. 9: 63-67. 1924.—Two sample plots each in beech and ash were laid out to discover why a heavy thinning increases wood production.—*W. H. Meyer.*

3360. JESSEN, P. Statistik over Ulykkestilfælde i Skovbruget. [Statistics on accidents in forestry.] Dansk Skovfor. Tidsskr. 9: 1-37. 1924.

3361. JONES, W. S. Timbers—Their structure and identification. xi + 148 p. 165 fig. Clarendon Press: Oxford, England, 1924.—This handbook is intended primarily to meet the requirements of students of forestry. Following a general discussion of the formation and structure of woody tissue and the fundamental principles applicable to the anatomical study of wood, a large number of European, American, and Indian broad-leaved species, and coniferous species from many countries, are described and illustrated with photomicrographs.—*W. N. Sparhawk.*

3362. JOY, GEORGE C. Fire conscious. Timberman 26¹: 65, 66, 68, 70. Fig. 1-10. 1924.—Weather conditions, particularly relative humidity and temperatures, are correlated with the occurrence of forest fires in Washington.—*Duncan Dunning.*

3363. KALSHOVEN, L. [G. E.]. Zoologische bijdragen. 1. Een topboorder bij Artocarpussoorten. (*Margaronia caesalis* Wlk., Lepidoptera, Pyralidae); 2. Vernieling van de vruchten van *Tectona grandis* L.f. door vogels en zoogdieren. [Notes on forest zoology for the Dutch East Indies. 1. A twig borer, *Artocarpus* sp.; 2. Teak fruits spoiled by birds and mammals.] (With a summary in English.) Tectona 15: 677-693. Pl. 36. 1922.

3364. KALSHOVEN, L. [G. E.]. Zoologische bijdragen. 3. De dierlijke beschadigingen van de mahonie (*Swietenia mahagoni* Jack. en *Sw. macrophylla* Jack.); 4. Insecten en de herkomst van *Tectona grandis* L.f. on Java. [Notes on forest zoology for the Dutch East Indies. 3. The injuries by animals to *Swietenia Mahagoni* and *S. macrophylla*. 4. Insects and the land of origin of *Tectona grandis* L.f.] (With a summary in English.) Tectona 15: 782-793. 1922.

3365. KALSHOVEN, L. [G. E.]. Zoologische bijdragen. 6. De rupsenplaag van 1921-22, in de Tjemarabosschen bij den Bromo. [Notes on forest zoology for the Dutch East Indies. 6. The caterpillar pest of 1921-1922 in the Casuarina forests near the Bromo, East Java.] (With a summary in English.) Tectona 16: 608-627. Fig. 50. 1923.

3366. KALSHOVEN, L. G. E. Zoologische bijdragen. 7. Schade ondervonden van droogh-outboeboek (*Lyctidae*). [Notes on forest zoology for the Dutch East Indies. 7. Powderpost beetles in East Indian woods.] (With a summary in English.) Tectona 16: 718-740. Fig. 55-58. 1923.

3367. KALSHOVEN, L. G. E. Zoologische bijdragen. 8. Boorders in woengoe vruchten. [Notes on forest zoology for the Dutch East Indies. 8. Fruitborer pests of *Lagerstroemia*.] Tectona 17: 455-461. Pl. 13-14. 1924.

3368. KOCH, WALTER. Modo de sacar automaticamente desde el aeroplano o dirigible mapas y planos por medio del autocartografo del Profesor Hegershoff. [Mapping from airplane or dirigible with Hegershoff's autocartograph.] México Forest. 1¹¹⁻¹²: 1-6. 5 fig. 1923.—This method is well adapted for making forest maps and classification of the stands.—*W. N. Sparhawk.*

3369. KRAMER, F. Cultuurproeven met *Acacia decurrens* op Java. [Cultivation of *Acacia decurrens* in Java.] (With a summary in English.) Tectona 17: 568-612. Pl. 19-22. 1924.—This tree can be planted successfully in the mountains of Java. It grows rapidly and yields about 1000-1200 kgm. of tan-bark per hectare per annum. The maximum yield is obtained

with a 5-year rotation. The tree is recommended as a nurse crop for forest plantations, and as a shade tree in tea plantations.—*Charles Coster*.

3370. LAFOSSE, HENRY. Les eaux et les bois. [Waters and forests.] 148 p. Payot: Paris, 1924.—The economic importance of waters and forests is discussed, and further extension of the forest area of France is recommended. At the same time steps should be taken to utilize the colonial forests in the tropics and, so far as possible, wastes in timber utilization should be eliminated.—*W. N. Sparhawk*.

3371. LANTERNIER, M. Conférence. [Address before the annual Congress of 1924.] Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est 15: 304-309. 1924.—After discussing the silvicultural operations of the German foresters in Alsace-Lorraine, between 1870 and 1918, it is concluded that in the rather severe climate of that region, conversion of coppice into high forest succeeds only on fertile soils. On poor soils it results in the elimination of oak by hornbeam.—*J. Kittredge, Jr.*

3372. MASON, DAVID T. Redwood for reforestation in the Douglas fir region. Timberman 26: 130, 132. Fig. 1-4. 1924.—Soil and climatic conditions are considered favorable for the introduction of redwood into the Douglas fir region west of the Cascade Range at elevations below 1500 feet. Redwood is recommended for planting because of heavy yields at early ages on good sites, and resistance to disease, insects, and fire damage. It produces good common lumber in 40-60 years. Experiments indicate that redwood seedlings may probably be field-planted after 1 year in the seed-bed, at less cost than Douglas fir. Uses may be developed for the fibrous redwood bark. A tree about 50 years old in Portland, Oregon, is 55 inches in diameter and 70 feet tall. A fairly well developed tree is growing in Victoria, B. C.—*Duncan Dunning*.

3373. MUNGER, THORNTON T. Objectives of the new federal forest experiment station. Timberman 26: 54-55. 1924.—The yield of 2nd growth Douglas fir, the correlation of weather records and the behavior of forest fires, slash disposal, and natural reproduction are among the problems now being investigated in the Pacific Northwest.—*Duncan Dunning*.

3374. NÉMEC, A., AND K. KVAPIL. Sur la composition des sols forestiers. [Composition of forest soils.] Compt. Rend. Acad. Sci. Paris 179: 537-539. 1924.—The forest of Saint-Markyta in Czechoslovakia was studied. The degree of acidity, and percentages of organic matter and nitrogen at different depths and from different types of forest are reported.—*C. H. Farr*.

3375. NOLTE. Begründung von Mischbeständen im Frassgebiet der Eule. [Formation of mixed stands.] Deutsch. Forstzeitg. 39: 1143-1144. 1924.—Soil impoverishment and the increasing losses from fungous diseases and insect epidemics indicate clearly the desirability of substituting mixed stands for the pure pine forests of northern and eastern Germany. The writer advocates planting 40-50 vigorous hardwood seedlings, preferably oak, to the ha. They should be planted in carefully prepared spots, and protected against mice, rabbits, and other animals.—*W. N. Sparhawk*.

3376. NOLTÉE, A. C. Over cultures in het djatiboschgebied. [Plantations in the teak region of Java.] (With a summary in English.) Tectona 16: 667-694. 1923.—The methods of regenerating teak forests are outlined, with suggestions on collecting and storing seed and on laying out nurseries for raising trees to be mixed with teak.—*Charles Coster*.

3377. OPPERMAN, A. Daekningsskov og Nabovirkninger. [Shelterwood and neighboring influences.] Dansk Skovfor. Tidsskr. 9: 367-384. Fig. 1-8. 1924.—More attention is now being given to the protection of the forest soil than to regularity of stand. In this connection, the author gives statistics on diurnal and seasonal variations in the amount and length of shadow and in the hours of sunshine. For 5 stations in Denmark the probability of occurrence of storms and their direction are listed. The greatest storm damage is most likely to occur in December.—*W. H. Meyer*.

3378. PRYTZ, C. V. Vedforraadets Vaerdi. [Value of the forest stand.] Dansk Skovfor. Tidsskr. 9: 38-45. 1924.—The standard formula for computing the cost value of a normal forest is given. The value of the stand is obtained by deducting the value of the soil from the total forest value.—*W. H. Meyer*.

3379. RAZOUS, PAUL. Aide-mémoire du commerce et des industries du bois. [Handbook

of timber trade and industries.] *xxii* + 332 p. 35 fig. Ecole de Sylviculture, du Commerce et des Industries du Bois: Paris, 1924.—The world timber situation is briefly discussed with particular reference to France's requirements, and the kinds, sizes, and prices of products handled by French timber dealers are described, with chapters on measurement, preservative treatment, and seasoning. A section is devoted to sawmill and wood-working machinery, and another to the principal wood-using industries. The laws relating to private, communal, and State forests are outlined.—*W. N. Sparhawk.*

3380. RECORD, SAMUEL J., AND CLAYTON D. MELL. *Timbers of tropical America.* *xviii* + 610 p. 51 pl. Yale Univ. Press: New Haven, Connecticut; and Oxford Univ. Press: London, 1924.—Part I (by MELL) describes briefly the various countries and their forests, and is "largely in the nature of an introduction to the descriptions of the trees and their woods" which comprise Part II (by RECORD). The work deals with 75 families having trees growing naturally in tropical America, with emphasis upon those of greatest commercial importance. Each family is introduced with a brief consideration of its size, distribution, and economic importance, followed by a summary of the salient structural features of the woods. The more important genera and species are dealt with in such detail as their importance seems to warrant or as available information will permit. Two apparently new species are described and given provisional names, *Pithecolobium vinhatico* Record, and *Tecoma peroba* Record. It is concluded that the forests most likely to supply timber to the U. S. A. in the early future are those in Mexico, Central America, northern South America, and the lower Amazon Valley.—*W. N. Sparhawk.*

3381. ROBINSON, R. G. *Observations on forest plantations in Canterbury.* Canterbury [New Zealand] Agric. Coll. Mag. 4: 671-674. 1919.—A general account is given of methods and species suitable for planting under the conditions existing on the Canterbury Plains, New Zealand.—*H. H. Allan.*

3382. ROLDAN, ANGEL. *El oyamel. (Abies religiosa.)* México Forest. 11-12: 7-9. 2 fig. 1923.—The botanical characteristics and the distribution of the tree are briefly described. It furnishes fairly good, cheap lumber, makes good pulp, and yields a resin similar to Venetian turpentine. It reproduces well naturally, but is rather hard to raise in the nursery. Fir forests should be managed under a selection system.—*W. N. Sparhawk.*

3383. ROSENDAEL, J., EN A. THORENAAR. *De natuurlijke verjonging van ngerawan (Hopea mengarawan Miq.) in Zuid Sumatra.* [The natural regeneration of ngerawan (Hopea mengarawan Miq.) in South Sumatra.] (With a summary in English.) Tectona 17: 519-567. Pl. 15-18. 1924.—The properties of the tree and its wood are described, with notes on its growth and natural regeneration. A preliminary report is made on a survey of the vegetation of the reserved forests, with descriptions of the more important plants and small trees that spring up on burned over land.—*Charles Coster.*

3384. РУТОВСКИЙ, Б. [RUTOVSKI, B.] *Хвойные масла и их производство кустарным способом.* [Resin substances and their production by small-scale methods.] 63 p. 26 fig. Всекоопес [All-Russian Cooperative Forest Union]: Москва [Moscow], 1922.—This booklet discusses the nature of resins, the general principles governing their extraction, and various methods employed in Russia, France, and America for small scale extraction, including portable apparatus.—*W. N. Sparhawk.*

3385. Saviñon, ABRAHAM FERRIZ. *Una riqueza forestal no explotada en Mexico.* [An unexploited forest resource of Mexico.] México Forest. 11-12: 10-11. 1923.—A few of the more important tannin-yielding plants are mentioned. The Experimental Industrial Laboratory at Mexico City has made a technical study of a few species.—*W. N. Sparhawk.*

3386. SCHNEPPER, W. C. R. *Benzoecultuur en volkswelvaart in Tapanoeli (Sumatra).* [Cultivation of Benzoe in Tapanoeli (Sumatra).] (With a summary in English.) Tectona 16: 264-275. Fig. 14. 1923.

3387. SCHNEPPER, W. C. R. *Pinus Merkusii Jungh. et de Vr.* (With a summary in German) Tectona 17: 352-356. Pl. 8. 1924.—The distribution of this tree in northern Sumatra is discussed, with notes on its natural regeneration.—*Charles Coster.*

3388. SCHWAPPACH. *Staatsforstwirtschaft als selbständiges Unternehmen.* [State forestry as an independent undertaking.] Deutsch. Forstzeitg. 39: 1100-1102. 1924.—Czecho-

slovakia, Austria, Poland, and Russia have recently put control of their forests under more or less independent branches of their governments. There is considerable danger that this will lead to exploitation rather than conservative handling of the forests.—*W. N. Sparhawk.*

3389. SCHWAPPACH. [Rev. of: ENGLER, ARNOLD. *Die Hochdurchforstung*. [Thinning from above.] Mitteil. Schweiz. Zentralanst. Forst. Versuchsw. 13²: 285-351. 1924.] Deutsch. Forstzeitg. 39: 1055-1058. 1924.—Engler's conception of thinning is similar to the French "éclaircie par le haut," except that he allows more latitude in treatment of the subordinate stand. Yield studies of stands treated by this method have given rather unsatisfactory results, because principally spruce and fir have been studied, while the method is best adapted for broad-leaved trees or mixed broad-leaved and coniferous species. The principles developed by Engler are outlined.—*W. N. Sparhawk.*

3390. SCHWAPPACH. [Rev. of: GOETHART, J. W. C., P. TESCH, E. HESSELINK, EN M. D. DIJT. *Cultuur- en waterleidingbelangen. Uittreksel uit het rapport over den invloed van wateronttrekking door waterleidingen op de vegetatie*. (Relation between diversion of water and vegetation.) Mededeel. Rijksboschbouwproefsta. 1³: 5-28. 1924.] Deutsch. Forstzeitg. 39: 1126-1127. 1924.

3391. SCHWAPPACH. [Rev. of: WIEDEMANN, EILHARD. *Fichtenwachstum und Humuszustand*. (Growth of spruce and condition of the humus.) Arbeit. Biol. Reichsanstalt. Landu. Forstw. 13: 1-77. 1924.] Deutsch. Forstzeitg. 39: 1081-1084. 1924.—The author has changed his opinion that growth stagnation in spruce forests results from soil deterioration following clear cutting, and now attributes it primarily to an upsetting of the equilibrium between accumulation and decomposition of humus. He advocates the "Dauerwald" only in a biological sense; that is, the maintenance of forest conditions, or the biological, chemical, and physical factors essential to healthy humus and soil. Maintenance of a uniform growing stock and abolition of clear cutting are not deemed important.—*W. N. Sparhawk.*

3392. SHOW, S. B., AND E. I. KOTOK. *The role of fire in the pine forests of California*. U. S. Dept. Agric. Bull. 1294. 1-78. 6 pl. 1924.—The authors trace the influence that fires have exerted in the mixed pine stands of California from the earliest known history, as recorded in the trees themselves, up to the present day. It is shown that the present sub-normal stocking of old-growth stands is largely the result of past fires. Many of the largest and most valuable trees have been destroyed as a result of the gradual enlargement of basal fire-scars, which made them susceptible to windfall or fungous attacks. Crown fires rarely occur in these forests; most fires are comparatively light, running along the surface of the ground and consuming only the litter and lighter fuels. Repeated burnings not only gradually reduce the amount of old timber and young growth, but they also injure the productive capacity of the soil by reducing humus content. The rate of growth of individual trees is also reduced by direct injuries, and inferior species are encouraged. Fire is not merely the enemy of the standing timber, but its cumulative effect threatens the ultimate transition of the forest to brushfields or scrub. The use of fire to improve pasturage and for similar purposes is incompatible with timber growing, and of doubtful value even to the stock interests.—*E. N. Munnis.*

3393. WACKERMANN, A. E. *The forest redemption of Michigan*. Lumber World Rev. 46¹: 30-31. 4 pl. 1924.—In spite of destructive logging and repeated fires, much of Michigan's forest area now bears young growth of species which will produce merchantable material if protected from fire. These are chiefly oak, jack pine, aspen, or mixed hardwoods, but the more valuable white and Norway pines of the original forests are coming in beneath them.—*C. E. Behre.*

3394. WEIS, F. *Undersøgelser over Jordbundens Reaktion og Nitrifikationsevne i typiske Danske Bøgeskove*. [Investigations of soil reaction and nitrification capacity in typical beech forests of Denmark.] Dansk Skovfor. Tidsskr. 9: 185-336. Pl. 1-37. 1924.—The present stand does not indicate soil acidity, as some of the best forests are on the most acid soils. Because of extraction of the bases by the trees, and the action of H_2CO_3 , the top soils in all forests are acid, even where underlain by subsoils of high lime content. Nitric acid formation is taking place in the highly acid soils under the better forests, but not in the poorer class of forests, even where acidity is lower. Application of lime is needed to correct acidity,

and excessive "beech weariness" of some soils may even necessitate a change of species. Light demanding trees should be mixed with tolerant species such as beech and red spruce, in order to prevent the soil from becoming too acid.—*W. H. Meyer.*

3395. WOLFF VON WÜLFING, H. E. Stambeschadigung bij djati (*Tectona grandis* L.f.). [Damage to the trunks of young teak (*Tectona grandis* L.f.) caused by the tearing off of branches.] (With a summary in English.) *Tectona* 16: 628-635. *Fig. 51-54.* 1923.—The natives tear off the branches to obtain the leaves as wrapping-material for food.—*Charles Coster.*

GENETICS

ORLAND E. WHITE, *Editor*

(See also in this issue Entries 3170, 3175, 3267, 3482, 3521, 3621, 3699, 3700, 3815, 3880, 3917, 3965, 3988)

3396. ANONYMOUS. [Rev. of: MACBRIDE, E. W. An introduction to the study of heredity. (Home University Library of Modern Knowledge.) 256 p. Williams & Norgate: London; H. Holt & Co.: New York, 1924 (see Bot. Absts. 14, Entry 2604).] *Nature* 114: 570. 1924.

3397. ANONYMOUS. [Rev. of: SMITH, G. ELLIOTT. The evolution of man: essays. viii + 159 p. Oxford University Press: London, 1924.] *Nature* 114: 410. 1924.

3398. ALLEN, CHARLES E. Inheritance by tetrad sibs in *Sphaerocarpos*. *Proc. Amer. Phil. Soc.* 63: 222-235. 1924.—Two characters, polyclady and tuftedness, are studied in their relation to the method of chromosome segregation in *Sphaerocarpos donnellii*, a species in which the 4 spores formed by the division of a single spore mother cell are regularly held together at maturity. Observations of the progeny of 2 sporophytes produced by the mating of typical females with polycladous males show that in the majority of cases the reduction division results in the production of either 2 typical females and 2 polycladous males or of 2 polycladous females and 2 typical males; but that in a few cases it brings about the formation of 4 qualitatively different spore nuclei. Observations of the progeny of 2 sporophytes produced by the mating of typical females with tufted males show likewise that in the majority of cases each tetrad is composed of 2 and only 2 types of spores and that in a few cases there may be evidence of 4 types of spores in a single tetrad. The physical bases determining the appearance or non-appearance of either polyclady or tuftedness are borne on a pair of chromosomes other than the X-Y pair. It is inferred that in *Sphaerocarpos* the heterotypic division in general effects the segregation of chromosomes, but that the additional possibility exists of a segregation at some time or to some extent of chromosomes or parts of chromosomes in the course of the homeotypic division.—*Wanda Weniger.*

3399. ALVERDES, F. Über die Variabilität der Monstrositäten unter besonderer Berücksichtigung eigener Untersuchungen am Schwein. [The variability of monstrosities, with special reference to some investigations with swine.] *Anat. Anzeiger* 57: 1-17. 14 fig. 1923.—The author describes a litter of 5 pigs all more or less abnormal. Some toes were doubled, some were lacking. The radius and ulna were fused in some cases, as were also the tibia and fibula.—*Sewall Wright.*

3400. ANDRONESCU, D. [I.]. Introducere la studiul și organizarea ameliorării plantelor agricole. [Introduction to the study and organization of plant improvement.] *Bul. Agric. [București]* 2 (1922): 40-54. 1922.—In this article the results, to date, of genetics versus plant improvement are discussed. The appointment of a special committee in the Rumanian Department of Agriculture for economic plant improvement has become a recognized necessity.—*Al. Borza.*

3401. ANDRONESCU, D. I. Contribuție la studiul și ameliorarea porumbului. [Contribution to the study and improvement of maize.] *Bul. Agric. [București]* 4 (1922): 45-68. *Fig. 1-8.* 1922.—In the introduction, all the cultivated Rumanian maize varieties are critically described in detail: Pignolett, Lahovary, Hanganesc, Cincatin, Pferdezahl Sekler, and the common Rumanian varieties. Then follows a discussion of improvement and selection methods.—*E. Pop.*

3402. AUSBORN, ERICH. Eine mendelistische Weizenbastardierung. [A Mendelian wheat hybridization.] Zeitschr. Pflanzenzücht. 10: 1-S. 6 fig. 1924.—Reciprocal crosses between 2 spring wheat varieties gave similar results. Red bran color dominated yellow bran. Heterosis was evident in culm length, weight of plant and grain per plant. Glume color segregated according to a simple 3 : 1 ratio. In the F_2 generation culm length and ear length showed intermediacy as to mode and greater variability than either parent. Ear thickness, on the contrary, was apparently significantly greater than for either parent.—*L. R. Waldron.*

3403. BARKER, H. D. A study of wilt resistance in flax. Minnesota Agric. Exp. Sta. Tech. Bull. 20. 1-42. Pl. 1-14. 1923.—The results of experiments on phases of wilt (*Fusarium lini*) resistance in flax are given in tabular form. These results indicate that resistant genotypes may be selected and propagated but that further selection does not change the degree of resistance. A wilt-resistant strain does not lose its resistance when grown on clean soil. The degree of resistance is relative and is modified by environmental conditions. Two superior wilt-resistant varieties have been developed, Chippewa, Minnesota No. 181, and Winona, Minnesota No. 182.—*Charlotte Elliott.*

3404. БАРУЛИНА, Е. [BAROULINA, E.] опыт Систематического изучения расового состава в пределах Одной разновидности Мягкой пшеницы (*Triticum vulgare* var. *ferrugineum* Al.). [Essay on a systematic botanical study of the characters [Jordanons] within the limits of one group of the soft wheat *Triticum vulgare* var. *ferrugineum* Al.] (Russian with English summary.) Труды по прикладной ботанике и селекции. [Bull. Appl. Bot. & Plant Breed.] 13: 259-367. Illus. 1923.—The material for the investigation includes 197 samples of spring and winter forms collected from all parts of the world. The study was carried on for the 5 years (1918 to 1922) with the material grown at Saratov and near Leningrad. Fifty different characters were studied, subdivided into 4 groups: Characters of ear and of grain, and vegetative and biological characters. There also is introduced an intermediate unit (Jordanons or isoreagents) grouping those races which are morphologically and physiologically akin, as (1) Indo-Europaeum; (2) Speltiforme; (3) Rigidum. Illustrations of these groups are included.—*J. Allen Clark.*

3405. BATESON, W. Somatic segregation in plants. (Summaries in English, Dutch, French and German.) Verslag Internat. Tuinbouw-Congres. P. 155-158. Amsterdam, Sept. 17-23, 1923.—Recognizing that the view that segregation of Mendelian elements is effected during the maturation of the germ-cells, must be in great measure correct, attention was called to evidence which strongly suggested that at least in plants, segregation might very commonly occur at other stages of the life history. Illustrations were cited especially from *Bouvardia* and *Pelargonium*, showing that propagation by roots produced in certain kinds and sometimes with much consistency, varieties quite distinct from the parent plants. Plants which have this property must be regarded as chimeras, and in some examples at least the chimera must be periclinal. The question arose whether "bud sports" so frequently seen in practical horticulture, resulting often in the production of a novelty (as in chrysanthemum, carnations) ought not largely to be regarded as evidences of an (original) mosaic nature rather than of a contemporary variation. Attention was called to the fact that when colors were distributed in certain patterns, the plant might regularly bear flowers of the same pattern and be bred true, whereas if the same colors were arranged on a different geometrical plan, neither would the flowers of a single plant be consistently uniform nor would the seed come true to the pattern. Picotee carnations were contrasted with bizzarres. Picotee, in which the color is in the edge of the petals, is a stable arrangement but bizarre, in which the colors are in wedge-shaped stripes, is not, though the pigments involved may be the same. Similar examples occur in *Tagetes* and *Dahlia*.—These phenomena point to distinctions in the geometrical or mechanical control of somatic segregation, but no analysis of its nature could as yet be attempted. The speaker hoped that practical horticulturists who witnessed analogous occurrences would make their experiences known, for they might not improbably give important clues to the geneticist.—(English summary.)

3406. BODMER-GIGER, HANS. Äussere Unterscheidungsmerkmale, insbesondere solche des Haarkleides der schweizerischen Feld- und Alpenhasen. (*Lepus europaeus* Pall. und

Lepus varronis Miller.) [External distinguishing marks, especially those of the pelage of the Swiss field and Alpine hares.] Zeitschr. Indukt. Abstamm. -u. Vererb. 35: 1-105. 4 pl. 35 fig. 1924.—The fur hairs of the Alpine hare are mostly finer, more abundant and more regularly curved; the overhairs have less pronounced tips in the Alpine hare than in the field hare. The summer hairs of the Alpine hare are similarly colored as in the field hare but less pigmented. The winter hairs of the Alpine hare are pure white except the ear tips; those of the field hare are similar to the summer color, only intermixed with individual white hairs. The pelts of both hares are of a distinct specificity. The Alpine hare in general is darker and the colors are more uniformly distributed. Within the typical seasonal colorations a distinct variation of the pigmentation intensity of the 2 types is observed. Body length and weight, ear and hind foot length show good species differentiations. The Alpine hare is on the average smaller and lighter, has shorter ears and longer hind legs. The hind legs of the Alpine hare are over 1.2 times as long as the ears; of the field hare, less than 1.2 times. The Alpine hare, in comparison with the field hare, is recognized by narrower and longer overhair of the back, forehead, breast and abdomen at all seasons. The fur hairs of the back are shorter in summer in the case of the Alpine hare. Overhairs and fur hairs of the breast show no differences from one season to another. The winter overhairs of the Alpine hare are always longer than those of the summer. The same is true for the field hare except in the case of the back cover hairs, which show no seasonal differentiation. The question whether the Swiss Alpine hare is an independent species (*Lepus varronis*) or a sub-species is not yet decided. The Swiss Alpine hare can scarcely be considered as a sub-species of *Lepus medius* Nilss. The Swiss Alpine hares form a uniform species or sub-species.—*L. R. Waldron and Erich Cahn.*

3407. CHACE, E. M., C. G. CHURCH, AND F. E. DENNY. Inheritance of composition in fruit through vegetative propagation. Bud variants of Eureka and Lisbon lemons. U. S. Dept. Agric. Bull. 1255. 1-19. 1924.—In these studies in cooperation with A. D. SHAMEL and his co-workers, analyses were made of fruit from parent and progeny trees of each of the well-defined strains of the important lemon varieties to determine possible variations in composition of fruit from individual trees, whether or not such variations are greater between different strains than between individual trees, and whether or not peculiarities of composition of the fruit of parent trees are transmitted to the fruit of progeny trees through vegetative propagation. As a whole the variability in fruit from the same tree is not great. Neither is there great variability of the fruit from different trees of the same strain, but marked differences in specific gravity and acidity were found between fruits from trees of several of the strains. The progeny trees are not yet old enough to study the inheritance of these differences.—*C. S. Pomeroy.*

3408. CHANG, TUNG WU. [A study of variation in mixed and pedigree strains of Mexican big boll cotton.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 8: 276-306. 1923.—The author describes the study of variation in mixed and pedigree strains of Mexican big boll cotton under, (1) comparison of botanical features and (2) comparison of quality of plant. In the study of qualitative variation, (1) yield, (2) length and uniformity of staples, (3) size of boll, (4) weight of seed, (5) percentage of lint, (6) lint index, and (7) number of seed, are fully discussed. The method of improving cotton and its economic importance are also briefly treated.—*Chunjen C. Chen.*

3409. COOPER, THOMAS, CASSIUS WAY, W. W. DIMOCK, E. S. GOOD, W. S. ANDERSON, A. M. PETER, AND D. J. HEALY. Discussions and demonstrations on breeding problems. Kentucky Agric. Exp. Sta. Circ. 30. 37-93. 1922.—This publication contains several talks given at a conference on horse breeding. Those particularly relating to genetics are entitled: Abortion, sterility and breeding hygiene; report of progress of work on sterility; genetics in relation to horse breeding; sterile males; the hydrogen-ion concentration of horse semen.—*W. D. Valleau.*

3410. CUNNINGHAM, J. T. Mendelism and evolution. Nature 114: 537-538. 1924. (Comment on Huxley's letter in Nature 114: 464. 1924.)

3411. DANIEL, L. Les hybrides de greffe. [Hybrids produced by grafting.] (Summaries in Dutch, English, and German.) Verslag Internat. Tuinbouw-Congres. P. 175-193. Amsterdam, Sept. 17-23, 1923.—I. The principal hybrids obtained by grafting, may be

divided into 3 groups which show a certain analogy with the sexual hybrids bearing the same names. (A) Mosaic-hybrids including—besides the well-known and frequently described Bizarria-orange and *Cytisus Adami*—4 more types that may be classified according to the lesser or greater complexity of their structure: (1) the rose, Mrs. Catbush, grafted upon sweetbriar; (2) the Amygdalopersica and the olives of La Marca; (3) the Solanum chimeras of Hans Winkler; (4) the Crataegomespilus plants of Bronvaux, Saujon and Tompa.—(B) Intermediary graft-hybrids, namely, *Pirocrataegus Willei* and *Pirocydonia Danieli*. The former is a graft-hybrid of *Pyrus communis* and *Crataegus oxyantha*, in practically every respect an intermediate between the two. The latter was obtained from an old graft of pear on quince; in other respects it is an intermediate, also as regards the susceptibility for *Accidium cancellatum*.—(C) Graft-hybrids with intensified characteristics, of which only 1 specimen is known, namely, *Pirocydonia Winkleri*, a dwarfish shrub with most of the characteristics of the 2 parents, but in either case intensified.—II. Origin of graft-hybrids. The initial hypothesis is from A. Braun who presumed that the syncreration of 2 cells would produce a new cell out of which the graft-hybrid would grow forth. Opposed to this theory is Winkler's opinion that in graft-hybrids 2 types of cells, each belonging to 1 of the parents, exist side by side; this being characteristic of graft-hybrids and at the same time accounting for that type. However, it must be observed, that this is out of the question in the case of intermediary and intensified graft-hybrids, and moreover that in several bastards and plants in which grafting is excluded, nevertheless 2 types of cells may appear conjunctively (sectorial marking in *Dahlia*, green and white chequered *Pelargonium*, etc.). Furthermore, the possibility of the syncreration of 2 cells after being injured has been shown in the case of *Phycomyces*. This seems to favor Braun's theory.—III. Practical application. No matter how one may account for the phenomena, some of them appear to have practical significance for horticulture. The 2 types of Crataegomespilus of Bronvaux are important on account of their luxurious and beautiful flowering. *Pirocydonia Winklerii* is a decorative shrub, eminently fitted for planting in groups or borders. With regard to the graft-hybrid problems, the 2 forms of *Pirocydonia* seem to promise possibilities hitherto unknown. Pear grafted upon quince for the purpose of obtaining the nanoid form is apt to become too vigorous on account of the quince being used as the parent stem; in order to obtain real nanisation, *Pirocydonia Winklerii*, being very dwarfish, will probably appear quite fit for the purpose of producing dwarfish pear-trees raised in pots.—(English summary.)

3412. DARROW, G. M. The Van Fleet raspberry; a new hybrid variety. U. S. Dept. Agric. Circ. 320. 1-14. *Illus.* 1924.—The origin of the Van Fleet red raspberry is given, together with descriptions of the plant and fruit, and of methods of propagation.—Richard Wellington.

3413. DAVENPORT, C. B. Influence of endocrines on heredity. Proc. 48th Ann. Ses. Amer. Assoc. for Study of Feeble Minded. 15 p. 1924. (Jour. Psycho-Asthenics 29: 132-144. 1923-1924.)—This is a study of Mongoloid dwarfs, a type of idiocy many of the examples of which show remarkable resemblance to each other and to the natives of South Eastern China. The resemblance does not depend upon similar chromosomes, since individuals may belong to different races and there is rarely more than 1 case found in a family. The similarity is probably due to similar endocrine disturbance of an accidental sort. The hypothesis is suggested that the chromosomes start the early stages of development of certain organs which, in turn, are responsible for the development of organs of a 2nd order and these in turn for organs of a 3rd order and so on, each stage providing the hormones for the next following stage. Especially in the later stages, abnormal environmental conditions may direct development into new channels whose course is determined by the nature of the external modifying agent.—Author.

3414. DAVENPORT, C. B. [Rev. of: GUYÉNOT, E. L'Hérédité. 463 p. (Encyclopédie scientifique.) O. Doin: Paris, 1924; GATES, R. R. Heredity and eugenics. xiii + 288 p. Fig. 1-35. The Macmillan Co.: New York. 1923 (see Bot. Absts. 13, Entry 852); COULTER, M. C. Outline of genetics with special reference to plant material. vi + 211 p. Fig. 1-31. Univ. of Chicago Press: Chicago, 1924 (see Bot. Absts. 13, Entry 840).] Science 60: 500-501. 1924.

3415. DE BEER, G. R. Introduction to the study of genetics. Part III. School Sci. Rev. 5: 211-215. 1924.—This is a discussion of "sex-linked" inheritance, "sex-limited" inheritance, and the determination of sex.—*Dorothy I. Neff*.

3416. DRY, F. W. The genetics of the Wensleydale breed of sheep. 1. The occurrence of black lambs—an examination of flock records. Jour. Genetics 14: 203-218. 1924.—The typical Wensleydale sheep has white wool but the skin of the face and ears is deep blue. Black lambs are produced in large numbers. Analysis of flock records indicated that black is a simple recessive as in other breeds of sheep but that dominance of white is not complete, the homozygotes having in general a paler blue in the skin and a coppery color inside the ears instead of the desired deep blue characteristic of the heterozygotes. Nearly all rams in the breed transmit black but a considerable number of the ewes, among which selection is less close, are homozygous. Flocks of blacks breed true.—*Sewall Wright*.

3417. FENG, C. C. [A glossary of genetic terms.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 8: 759-775. 1923.—This is an extensive list of technical terms used in the science of genetics. Terms are alphabetically arranged and given Chinese translations.—*Chunjen C. Chen*.

3418. FENG, C. C. [Inheritance in maize.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 8: 528-537. 1923.—A hereditary study of a factor for glossy leaf in corn seedlings is briefly reported.—*Chunjen C. Chen*.

3419. FIGINI, G. P. Osservazioni biometriche su fiori di *Helleborus niger* L. raccolti nel Comasco a Maggiano e Menaggio. [Biometrical observations on flowers of *Helleborus niger* L. gathered at Comasco, Maggiano and Menaggio.] Atti Soc. Nat. e Mat. Modena 6: 57-76. 1924.—The article is an attempt to correlate results with habitat, exposure and season. Collections were made from regions differing in temperature, exposure and nutrition. Late flowers have a reduced number of stamens and carpels and less intense color. Eight tables give frequencies. The stamens show a tendency to diminish with late flowers, season and nutrition. Confirmatory citations from several investigators indicate a great variability of floral parts in *Helleborus*. Stamens from Maggiano show greater variability and from the other 2 regions they show uniformity. This is also true of sepals, petals, and carpels. Fluctuations show a direct dependence on the season. A more nourishing substratum produces more and larger leaves and more flowers. Teratological observations were made in this study.—*Helen Deuss Hill*.

3420. FROST, H. B., AND MARGARET C. MANN. Mutant forms of *Matthiola* resulting from non-disjunction. Amer. Nat. 58: 569-572. 1924.—A strain of *Matthiola* constantly throws 2-5% of mutant types, 3 of which have been found to have 7 pairs and an odd, instead of the normal 7 pairs of chromosomes. In Large-leaved and Slender the odd chromosome is small and spherical or rod-shaped in 1st metaphase; in Crenate it is larger and V-shaped. Extreme Slender plants occur in selfed Slender progenies. They have 2 small chromosomes in addition to the 7 normal pairs. The mutants are generally less vigorous than the normal type; Extreme Slender is weaker than Slender. Slender \times Large gives 4 classes—Normal, Large, Slender, and Large Slender. Large Slender and Crenate Slender have 2 odd chromosomes. The mutants selfed give 25-50% of mutant progeny. Slender is associated with singleness of flowers, hence, since Slender is deficient in viability, its progeny contains an excess of doubles.—*Margaret Mann Lesley*.

3421. GEISE, F. W. The development of blight resistant spinach. Rept. Maryland Agric. Soc. and Maryland Farm Bur. Fed. 8: 171-183. 1924.—Virginia Savoy, a mosaic resistant spinach possessing desirable market qualities, is the result of a cross between Manchuria and Savoy. Comparative yields and resistance to mosaic are given in tabular form.—*Charlotte Elliott*.

3422. GÉRÔME, J. Le *Begonia* \times *Gigantea* Nonin, (Origine, histoire horticole). [*Begonia* \times *Gigantea* Nonin (origin, horticultural history).] Jour. Soc. Nat. Hort. France IV, 25: 280-282. 1924.—The history of the hybrid *Le Begonia* \times *Gigantea* Nonin is given and the confusion in nomenclature discussed.—*Richard Wellington*.

3423. GOLDSCHMIDT, RICHARD. Erblichkeitsstudien an Schmetterlingen IV. Weitere Untersuchungen über die Vererbung des Melanismus. [Genetic studies on Lepidoptera IV.

Further investigations on the heredity of melanism.] Zeitschr. Indukt. Abstamm.- u. Vererb. 34: 229-244. 4 fig. 1924.—The author discusses the various types of melanism, classifying them as occurring sporadically, as strongly localized, or as widely distributed; as varying continuously or discontinuously; and as darkening by increase in black areas or by suffusion of black pigment. Theories to explain progressive melanism, in which new dark form tends to replace the type previously found in nature, are discussed. On the basis of experiments by the author and by Standfuss, varieties of the Arctiid, *Callimorpha dominula*, are considered to differ by 2 factors for black pigment, but modifiers are also postulated. Breeding work by the author and by Federley on *Spilosoma lubricipeda* shows that dark differ from lighter forms by at least 1 genetic factor, but there is overlapping of classes.—P. W. Whiting.

3424. GOLDSCHMIDT, RICHARD. Richtigstellung zu "Untersuchungen über Intersexualität II." [A correction of "Investigations on Intersexuality. II."] Zeitschr. Indukt. Abstamm.- u. Vererb. 34: 244. 1924.—Correction is made in designations on antennal feathering of Gypsy moth shown in Fig. 2-11 of the article above cited.—P. W. Whiting.

3425. GUTHERZ, S. Geschlechtsgebundene Vererbung und Haploidie (bei Metazoen). [Sex-linked heredity and haploidy in Metazoa.] Arch. Mikrosk. Anat. 97: 419-427. 1923.—According to John Schmidt (1920), working with *Lebistes reticulatus*, a new and very singular method of inheritance has been described. If a race of males spotted on the hind fins be crossed with a spot-free race and the hybrids inbred for 5 generations, only the ♂ progeny develop spots. Inheritance is constantly from father to son. Supposedly, the spot-gene is constantly carried over without ever entering a ♀ zygote. A gene segregation would be guaranteed if one considered that the factor is localized in a Y-chromosome. In this case, non-conjugation would have to be considered as operating between the X and Y groups and the Y considered as other than empty. It will be of interest to determine if an X-Y type of chromosome mechanism exists in *Lebistes* and also if typical X-chromosome sex-linked inheritance or something entirely new is present. It is also possible that a particular kind of sex-limited inheritance is responsible (gene suppression in the ♀, and gene stimulation in the ♂). For this possibility, the spot would be considered an accidental sex character. In any case the *Lebistes*-type is not simple to explain and must be considered in a separate class. A further investigation will show if and in how far these relationships have to do with sex-linked inheritance and haploidy. A publication by C. B. BRIDGES (Amer. Nat., February, 1922) appears to have indirect bearing on our problem. He is of the opinion that the development of the normal sex character is a quantitative relationship between the X-chromosome and autosome material. By varying these quantitative relationships sex abnormalities occur. It is clear that this conception cannot serve for the case of the bees where, according to Wilson, Nachtsheim, and others, the hypothesis for the ♂ chromosome complex is $n + X$ and for the ♀ $2n + 2X$, so that the quantitative relationships would be the same in either case. A bibliography is appended.—H. C. Sands.

3426. HAGEDOORN, A. C., AND A. L. HAGEDOORN. Parthenogenesis in Cucurbita. Zeitschr. Indukt. Abstamm. u. Vererb. 34: 186-213. 1924.—Experiments were made with varieties of *Cucurbita* belonging to at least 2 species to determine whether it was possible by purely genetical methods to distinguish between parthenogenesis and apogamy. No seed were obtained from 106 protected female flowers on 18 different kinds. Among many hybrids, 5 combinations were obtained in which individual plants set fruit and produced viable seed from non-fertilized female flowers. In 4 of these 5 cases, the progenies showed segregation, in the sense that recessive characters of either parent, not to be seen in the hybrid, were again noted among the F_2 plants, often in new combinations. Self-fertilized seed of these parthenogenetic F_2 plants were tested but the results were unsatisfactory owing to adverse climatic conditions. Material for cytological examination has been submitted to several cytologists but no report has yet been made.—Richard Wellington.

3427. HEMLEBEN, HANS. Einige Bemerkungen über Generationswechsel, Abstammung und Geschlechtsverhältnisse der Zygnemales. [A note on metagenesis, ancestry and the sex-ratio of the Zygnemales.] Zeitschr. Indukt. Abstamm.- u. Vererb. 31: 185-191. 3 fig. 1923.—Definitions of alternation of generations are briefly discussed, and the extreme views

that conspicuous growth is necessary in both generations and that alternation of cell phases is sufficient, are contrasted. In all Conjugatae the zygote nucleus divides twice, giving 4 haploid nuclei. In the Mesotaeniaceae, the most primitive type, there are normal divisions, and 4 sporelings arise. In the Desmidiaceae there is only 1 cell-division. Each cell receives a large nucleus, and one, or both, or neither of the small nuclei, which disintegrate. In *Spirogyra* and *Zygnema* the spore mother cell is also the spore, and after the suppression of 3 nuclei the uni-nucleate sporeling appears. The situation is compared to that in the macrospores of the heterosporous ferns. In the heterothallic species of *Spirogyra* (those conjugating scalariformly), 4 nuclei arise, 2 ♂ and 2 ♀. Three of these are suppressed and the 1:1 sex-ratio is obtained. In the homothallic species (those conjugating laterally), all the nuclei are equivalent, and the persisting nucleus contains both ♂ and ♀ "anlagen." Comparing species of *Spirogyra* with the Mucors, *S. Speeiana* is of the Sporodinia type, hermaphroditic in both generations. The heterothallic forms, although they have but 1 spore, are compared to *Phycomyces*, which may produce spores of 1 sex only, in the germ sporangium, from the zygote. In *Spirogyra*, as in other plants, the homothallic is the primitive, the heterothallic the derived type.—*J. Lincoln Cartledge*.

3423. HEMLEBEN, HANS. Ueber den Kopulationsakt und die Geschlechtsverhältnisse der Zygnemales. [Copulation and sex relations of the Zygnemales.] Bot. Archiv. 2: 249-259, 261-277. Fig. 1-25. 1922.—(For abstract see Bot. Absts. 13, Entry 4355.)

3429. H[ILGENDOFF], F. W. European plant breeding methods. Canterbury [New Zealand] Agric. Coll. Mag. 4: 865-868. 1922.—A popular account is given of observations made during a tour of European plant-breeding stations.—*H. H. Allan*.

3430. IKENO, SEIITRÔ. Hérédité du *Plantago* major. [Heredity in *Plantago* major.] (Japanese.) Idengaku Zasshi [Japanese Jour. Genetics] 1: 70-80. 1 fig. 1922.—The content of this article is similar to that which the author has just published in Rev. Gén. Bot. 32: 49-56, 1920; except that he has added a table indicating the number of recessives (*contracta*) obtained from 2 dominant parents (*typica*) by mutation.—*Author*. (Courtesy Japanese Jour. Bot.)

3431. IKENO, S. Über einige Kreuzungsversuche bei den Rhododendron-Sippen. [Some crossing experiments with rhododendron species.] Studia Mendeliana. P. 104-111. 1 pl., 1 fig. Typos: Brünn, Czechoslovakia, 1923.—In Japan a number of species of rhododendron belonging to the subgenus *Azalea* are used as ornamentals. Among these species, plants are sometimes found which produce abnormal flowers. This paper deals with 3 such forms, hose-in-hose flowers, apetalous and sympetalous flowers. The hose-in-hose plants were found to be sterile, due to the abortive pistil, but they produced functional pollen. When crossed with the normal flowering type, 2 F₁ types were produced, the normal and the hose-in-hose. The normal F₁ plants were self-sterile, but crossed readily among themselves and produced from such fertilization only normal plants. The hose-in-hose plants are dominant heterozygotes of the constitution Aa; the normal F₁ plants are pure recessives, aa. The apetalous race is apparently produced by reduction of petals to stamens for there are 2 whorls of 5 each, and also all gradations of petalody have been found. When crossed with the normal form, 3 types were produced in F₁—normal forms, apetalous forms, and petalody forms which were intermediate between the normal and apetalous conditions. The explanation is that the apetalous forms are heterozygous for 2 pairs of genes, PpRr, the normal type is homozygous for the recessive genes, pppr, and the intermediate apetalous forms represent the 2 types heterozygous for 1 pair of genes, ppRr and Pprr. On this basis a close correspondence was obtained between observed and calculated numbers. The polypetalous race is characterized by a complete separation of the corolla lobes. The polypetalous flowers were pistillate due to complete abortion of the anthers. By crossing the polypetalous with the sympetalous race it was shown to be heterozygous for a single pair of genes for which the sympetalous race was homozygous.—*J. L. Collins*.

3432. KRELAGE, ERNST H. Development of the dahlia. (Summaries in Dutch, French and German.) Verslag Internat. Tuinbouw-Congres. P. 42-60. Amsterdam, Sept. 17-23, 1923.—This paper contains a summary of the history of the dahlia, with information on the origin of the double variety, the Show type, the Lilliput type, the Green dahlia, various forms of single dahlias, Cactus dahlias, and the numerous other types.—*Orland E. White*.

3433. KRELAGE, E[RNST] H. The development of the dahlia. Gard. Chron. III, 74: 238, 250, 251. 1923.—A history of the following types of dahlias is given: The pompom (Lilliput) type was introduced in 1851; the show type in 1855; the single type in 1880; the cactus type in 1890, by selection this later gave rise to the decorative type; the miniature pompom cactus type in 1895; and, about 1903, the peony type. In 1846 there were approximately 300 varieties on the market. The popularity of the dahlia was high in its first years but declined in the early sixties and did not rise until the introduction of the cactus type in 1890.—*Harold E. White.*

3434. KRÖNING, FRIEDRICH. Über die Modifikabilität der Säugerscheckung. [The non-genetic variability of the piebald patterns of mammals.] Zeitschr. Indukt. Abstamm.- u. Vererb. 35: 113-138. 5 pl., 21 fig. 1924.—After a review of the evidence for nongenetic variation of piebald patterns from breeding experiments, the author compares the components of a considerable number of spotted double monsters (11 calf, 2 cat, 3 goat, 7 swine) in order to determine the amount of variation in individuals of identical genetic constitution. He concludes that there is considerable variation of this sort, especially in regard to the details of localization.—*Sewall Wright.*

3435. LENZ. [German rev. of: KRETSCHMER, E. Körperbau und Charakter. Untersuchungen zum Konstitutionsproblem und zur Lehre von den Temperamenten. (Body structure and character. Investigations of the problem of constitution and of our knowledge of temperament.) 2 Aufl. 195 p. Julius Springer: Berlin, 1922.] Arch. Rass.- u. Gesellschaftsbiol. 16: 111-117. 1924. [See also Bot. Absts. 12, Entry 3990.]

3436. LJUNGAHL, HILDE. Über die Herkunft der in der Meiosis konjugierenden Chromosomen bei Papaver-Hybriden. [Origin of the chromosomes that conjugate in meiosis in Papaver-hybrids.] Svensk Bot. Tidskr. 18: 279-291. 4 fig. 1924.—Of the author's extensive cultivation experiments with *Papaver* some results are published regarding the conjugation of the chromosomes in some artificially raised hybrids. The problem is, whether the chromosomes conjugating have come from 2 different parents, according to the hypothesis of Montgomery, or from the same parental gamete. This problem has previously been studied through comparisons between hybrids with different numerical proportions of bivalent and univalent chromosomes (Täckholm, on *Rosa*) or through genetical experiments (Müller-Gregory, on *Primula*; Blakeslee, on *Datura*). In the present paper the experimental-cytological method is adopted. Only hybrids between such species or forms can be used, of which the one has at least 2 complete chromosome sets more than the other. Beside the conjugation of chromosomes from both parents there is then the possibility given for conjugation of homologous chromosomes from the same parent. The author has made 2 such crosses. *Papaver nudicaule* L. ($x = 7$) \times *P. radiculatum* Rottb. ($x = 35$) and *P. nudicaule* L. ($x = 7$) \times *P. nudicaule* var. *striatocarpum* Fedde ($x = 35$). The F_1 of both hybrids show 21 gemini and no univalents. This must be interpreted so that 7 *nudicaule*-chromosomes have conjugated with 7 chromosomes from the other parent, while the rest (28 chromosomes from 1 parent) have conjugated into 14 gemini. Such gemini-formation, where the conjugating chromosomes come from the same gamete, the author calls "autosyndese" or "autokonjugation," the conjugation between the paternal and maternal chromosomes, again, is called "allosyndese" or "allokonjugation." "Autosyndese" has previously been reported from XXV non-disjunctional individuals of *Drosophila melanogaster* (Bridges), from a *Digitalis*-hybrid (Haase-Bessel) and from *Viola tricolor* \times *V. arvensis* (Clausen), the last-mentioned case, however, being somewhat doubtful. The F_2 of the above *Papaver*-hybrids show a regular meiosis with 21 gemini. The back-cross, (*P. striatocarpum* \times *P. nudicaule*) ($x = 21$) \times *P. nudicaule* ($x = 7$), gave a hybrid with regular meiosis and 14 gemini; the back-cross with *P. striatocarpum* would probably have given a form with 28 gemini. In this case it is clear that tetraploid, hexaploid and probably also octoploid forms may arise from a cross between a diploid and a decaploid species and subsequent back-crosses with the parents.—*O. Heilborn.*

3437. LONGLEY, A. E. Cytological studies in the genera *Rubus* and *Crataegus*. Amer. Nat. 57: 568-569. 1923.—Like *Rosa*, the polymorphic genera, *Rubus* and *Crataegus*, consist of diploid and polyploid species. The former are characterized by normal chromosome reduction, the latter by pollen sterility, variability of offspring, irregular chromosome distribution,

polycary and polyspory, "features all clearly associated with hybrid forms."—Margaret Mann Lesley.

3438. LOVE, H. H. *Genetics*. Jour. Amer. Soc. Agron. 16: 614-626. 1924.—This paper points out some ways in which the science of genetics has been of service in the practical work of crop improvement. Improved and efficient methods for use in practical improvement projects have been developed from genetic experiments conducted to demonstrate the truth regarding certain hypotheses. Attention is called to the value derived from studies involving hybridization of varieties and of species in regard to the mode of inheritance of such characters as disease resistance and earliness. The knowledge regarding heterosis may be of practical importance. Some problems of crop improvement which require a genetic attack are suggested.—J. L. Collins.

3439. MARVIN, F. S. *The ascent of man*. [Rev. of: LODGE, OLIVER. *Making of man: a study in evolution*. 185 p. Hodder & Stoughton: London, 1924.] Nature 114: 408. 1924.

3440. MILLAIS, J. G. *Rhododendrons and the various hybrids*. 2nd Ser. xii + 265 p., 17 col. pl., 14 collotype pl., 22 half-tone pl. Longmans, Green & Co.: London, 1924.—Chapter III, New hybrid Rhododendrons, gives lists and more or less description of new hybrid Rhododendrons created and raised by various English and Dutch workers. Pages 75-263 are devoted to an alphabetically arranged list of Rhododendron species and hybrids, with detailed descriptions of shrub and flower.—Dorothy I. Neff.

3441. MIYAZAWA, BUNGO. *Rhododendron indicum* Sweet var. *obtusum* Max. (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 1: 153-157. 1922.—The flowers of *Rhododendron indicum* var. *obtusum* (the Japanese "Kirisimatutuzi") are either single or double. Under normal conditions the single flowers are almost always fertile, but owing to self-pollination are frequently sterile. The flowers are protanderous: usually the stigma secretes stigmatic fluid first on the day after the flower opens; but one can secure seed by pollination even before the stigmatic fluid has been secreted. The pollen remains viable for at least a month. The hybrids between different varieties of the *Rhododendron* species under discussion are always fertile. Species-hybrids have also been produced (*R. indicum* and *R. sinense*). Through hybridization experiments, the author found upright stem to be dominant over horizontal; leaf-breadth and size of flower to be intermediate between the 2 parents; almost complete dominance of single over double flower, the difference conditioned by a single gene; self-colored flower dominant over variegated; and short stamens dominant over long.—Author. (Courtesy Japanese Jour. Bot.)

3442. MORGAN, T. H. *Human inheritance*. Amer. Nat. 58: 385-409. 1924.—It is evident that the same laws of heredity apply in both plants and animals. In *Drosophila* about 400 new characters have been observed, most of them disadvantageous. This is probably because nearly all the useful possibilities have already become incorporated by the germplasm of the species, which explains why mutations in *Drosophila*, as well as in man, seem to be prevaillingly unfavorable. The recognition of modifying factors which produce quantitative effects is the special contribution of genetics to evolution. Supposed evidence for the inheritance of acquired characters and for "somatic induction" will not on the whole stand critical examination. Social inheritance is of such great importance in human affairs as to predispose uncritical thinkers to readily accept the idea of inheritance of acquired characters in the biological sense. But the gap between germplasm and soma is now wider than ever before. There is a wakening realization that the study of human progress is possible and prosecution of the desired studies will not long be left in the hands of amateurs.—C. H. Danforth.

3443. OPOIX, O. *Une orchidée hybride dans le genre Phajus* (*Phajus opoixii* var. *aurea* et *tenebrosa*). [An orchid hybrid in the genus *Phajus*.] Rev. Hort. 96: 212-213. *Illus.* 1924.—Varieties *aurea* and *tenebrosa* of *Phajus Opoixii*, obtained by O. Opoix by hybridizing *P. Wallichii* with *P. Humboldtii*, are described and their flowers illustrated by a colored plate. Richard Wellington.

3444. PETRI, L. *L'ereditarietà e l'incrocio nelle piante*. II. *La questione dell'ereditarietà dei caratteri acquisiti*. [Inheritance and crossing in plants. II. The question of the inheritance of acquired characters.] L'Alpe. 2nd Ser., 9: 240-244. 1922.—This article is a

very generalized discussion, indicating the problem. Those who have dealt with it are classified as Lamarckians, Selectionists or Neodarwinians, and Darwinians. Inheritance of acquired characters is defined as transmission of somatic variations by sexual reproduction to successive generations. Experimental work should deal with pure lines, so as to exclude selection. Due to past experimental difficulties the question is still in the hypothetical stage.—*Helen Deuss Hill.*

3445. PLATE, L. [German rev. of: HAGEDOORN, A. C., AND A. L. HAGEDOORN. *The relative value of the processes causing evolution.* 288 p. 20 fig. Martinus Nijhoff: The Hague. 1921.] Arch. Rass.- u. Gesellschaftsbiol. 16: 203-209. 1924.

3446. PLATE, L. [German rev. of: WALTER, H. E. *Genetics: an introduction to the study of heredity.* Revised ed. xvi + 354 p. 92 fig. Macmillan Co.: New York & London, 1922 (see Bot. Absts. 12, Entry 3280).] Arch. Rass.- u. Gesellschaftsbiol. 16: 209-210. 1924. [See also Bot. Absts. 12, Entry 1044.]

3447. POGGI, T. *Elettrogenetica.* [Electrogenetics.] II. Coltiv. 70: 163-165. 1924.—This is a most favorable review of a book entitled "Electric mutations in botanical species and the study of heredity in hybridization," by ALBERTO PIROVANO, which is to be translated into German and then into other languages. The chief point is the modification of pollen subjected to electro-magnetic current such that in fertilization it produces noteworthy mutations. Pirovano calls the treatment and subsequent modification "jonolisis" (ion-analysis). Reference is also made to A. BRUTTINI, "Influence of electricity on vegetation," Hoepli, Milan, 1924, and to G. D. MAYER, "Electricity in agriculture," Hoepli, Milan, 1924.—*Helen Deuss Hill.*

3448. PUNNETT, R. C. The genetical analysis of the sweet pea (*Lathyrus odoratus*). *Verslag Internat. Tuinbouw-Congress. P. 201-206.* Amsterdam, Sept. 17-23, 1923.—This paper contains suggestions on sweet pea breeding, from a practical standpoint. The problem of how long a pure, self-fertilized variety will maintain itself is also considered. The author especially desires that sweet pea growers, upon finding any queer or unusual variety, no matter of how little horticultural or practical value, send him a few seed.—*Orland E. White.*

3449. RUF, SEPP. *Familienbiologie eines Schwarzwaldorfes mit besonderer Berücksichtigung der letzten 100 Jahre.* [Family biological history of a Schwarzwald village with particular consideration of the last 100 years.] Arch. Rass.- u. Gesellschaftsbiol. 15: 353-382. 1924.—This article is a biological account of the population of St. Peter and the adjacent valleys east of Freiburg by one of them as an example of the new "family anthropology" studies initiated by E. Fischer. Some characteristics are: large families, much consanguineous marriage (without much bad result); inherited fecundity (3 mothers have together 47 children); excess of male live births (100 ♀ : 111 ♂); some alcoholism; no inferiority of last born (system of ultimogeniture in heirship); large twin rate (1.36%) with inheritance in male as well as female line; family name associated with occupation; hereditary depression (increased by inbreeding). There is some disappearance of family names by emigration; sparsity of sons or childlessness; high illegitimacy. Some families are characterized by criminality; late development; recessive hair and eye colors (especially in inbred stock); absence of gray hair; baldness; special head shape; longevity; epilepsy and goitre.—*C. B. Davenport.*

3450. S., A. M. C. *Social science.* [Rev. of: (1) DENDY, ARTHUR. *The biological foundations of society.* x + 197 p. 17 pl. Constable & Co.: London, 1924; (2) SWINBURNE, J. *Population and the social problem.* 380 p. G. Allen & Unwin: London, 1924.] *Nature* 114: 405-406. 1924.

3451. SANDU ALDEA, C. *Introducerea în genetică.* [Introduction to genetics.] *Viața Agric. București* 13: 97-100. 1922.—Modern genetics is discussed in this article.—*Al. Borza.*

3452. SASAKI, RINTARÔ. [Inheritance of resistance to *Piricularia Oryzae* in different varieties of rice.] (Japanese.) *Idengaku Zassi* [Japanese Jour. Genetics] 1: 81-85. 1922.—This article gives the results for 1918 of investigations made at the Agric. Exp. Sta. at Ehimeke. By means of the artificial infection of different varieties of rice by *Piricularia oryzae*, the author was able to induce the disease (American "rice-blast") as well as to distinguish the immune and the susceptible varieties. He made a number of crosses between the 2 types. As shown by these crosses, immunity is dominant over susceptibility, and in F₂ the immune

and susceptible individuals are in general represented in the ratio of 3 : 1. The author was also able to verify this last fact by growing the F_3 generation in so far as he could thereby distinguish the immune homozygotes, the immune heterozygotes (that is, those which split up in the next generation into a ratio of 3 immune:1 susceptible) and the susceptible homozygotes, and so approximately in the ratio of 1:2:1. Although the number of apparently immune individuals in F_2 amounts in general to approximately 75%, yet it varies between 55 and 90% and by plotting the curve of variability, the author concluded that this variation is a single fluctuation.—*Author.* (*Courtesy Japanese Jour. Bot.*)

3453. SAX, KARL. The nature of size inheritance. *Proc. Nation. Acad. Sci.* [U. S. A.] 10: 224-227. 1924.—This is a summary of work on beans, with a discussion of papers by Castle and others on size inheritance. The results of recent experiments on size inheritance in beans "show clearly that differences in size and total yield are, to some extent at least, dependent on genetic factors which are linked with factors for simple qualitative differences and are therefore inherited in the usual Mendelian manner. The association of differences in total yield with certain qualitative characters may be of value in selecting superior segregates in hybrids of economic species." Size factors when combined have a cumulative effect.—*C. W. Metz.*

3454. SCHIEMANN, E. Neuere genetische Arbeiten über Getreide. [New genetical work on cereals.] [German rev. of: KAJANUS, B. (1) *Genetische Untersuchungen an Weizen.* (Genetical studies on wheat.) *Bibliotheca Genetica* 5. 187 p. 6 pl. Leipzig, 1923 (see Bot. Absts. 13, Entry 7716).—(2) *Über Ährchenabstand und Ährchenzahl bei Nachkommen von Speltoidheterozygoten.* (Head density and number of spikelets in offspring of speltoid heterozygotes.) *Hereditas* 4: 10-16. 1923 (see Bot. Absts. 12, Entry 4942).—(3) *Über Ährchenabstand und Ährchenzahl bei einigen Weizenkreuzungen.* (Head density and number of spikelets in some wheat crosses.) *Hereditas* 4: 290-340. 1923 (see Bot. Absts. 13, Entry 859).—(4) *Über die Fertilität in Kreuzungen zwischen verschiedenen Weizenarten.* (The fertility of crosses between different varieties of wheat.) *Hereditas* 4: 341-350. 1923 (see Bot. Absts. 13, Entry 7066).] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 35: 106-112. 1924.

3455. SCHRADER, FRANZ. Haploidie bei einer Spinnmilbe. [Haploidy in a red spider.] *Arch. Mikrosk. Anat.* 97: 610-620. 1923.—The author worked on the 2-spotted American red spider, *Tetranychus bimaculatus*. In the egg maturation division, 3 tetrads are found near the wall of the sphere. Three dyads are formed on the 1st division. There is no difference between the 2 groups resulting from this division. Polar bodies are formed, leaving the egg with 3 chromosomes. It could not be determined which of the 2 represented a reduction division. The eggs fall into 2 classes, fertilized and unfertilized. Both kinds proceed with their cleavage divisions, those with 6 chromosomes giving females and those with 3 giving males. The size relationships of the chromosomes are the same whether cells contain 3 or 6 chromosomes. In the blastoderm, 2 classes of embryo exist. Larvae fixed in Fleming's or Allen's modified Bouin solution gave good material and the 2 classes were followed here as well as in the nymph stages. Older nymphs gave no chromosome pictures. Spermatogenesis studied in the testes of larvae showed 3 chromosomes which underwent no reduction division but gave directly the spermatids without going through a rest and growth stage. What corresponded to the 1st reduction division differed in no way from the spermatogonial divisions. With this, the essential life cycle is completed.—*H. C. Sands.*

3456. SIEMENS, H. W. Die Leistungsfähigkeit der zwillingspathologischen Arbeitsmethode. [The value of studying "pathological" human twins.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 33: 348-349. 1924.—In this abstract the author points out the usefulness of studies of human twins in the solution of problems of inheritance, especially in distinguishing heritable from non-heritable variations. Thus, in comparisons between identical (1-egg) and 2-egg twins, left-handedness and birthmarks appear to be non-heritable, while freckling appears to follow a more complex mode of inheritance than that heretofore proposed. An inherent disposition to an environmentally determined condition may also be established, as in the case of endemic goitre which was found to be regularly present in both members of pairs of 1-egg twins among Munich school children.—*L. C. Dunn.*

3457. STEIN, EMMY. Zur Genetik und Phylogenetik der Gattung *Salix*. [Genetics and

phylogeny of the genus *Salix*.] Zeitschr. Indukt. Abstamm.- u. Vererb. 34: 249-258. 1924.—Kerner v. Marilaun is cited as originally holding the idea that new species may come from hybrids. Max Wichura, scientific predecessor of Mendel, provided the classical foundation for the work on *Salix* by his insistence on experimentation. He made 116 crosses, showed the existence of spontaneous hybrids in nature and destroyed the assumption of their sterility. His main goal was to unite the largest possible number of species in a hybrid, as being relevant to the origin of new variations. Intermediates, as well as tendencies toward dominance were found. Heribert-Nilsson has modernized Wichura's work. He has contributed factorial analysis to the work on *Salix*. Contrary to Wichura, primary hybrids were usually found to be vigorous. Very great variability was found in a hybrid population of 157 F₂ plants, from *S. viminalis* × *S. caprea*. A small number of "polymerous" factors underlie the F₂ variability. These polymerous factors constitute the species characters, while simple factors condition the variations. Simple Mendelian inheritance is shown by scar length only, the other characters graded off in a series. Sex ratios showed preponderance of ♀ plants. Heribert-Nilsson considers the problem of variation experimentally soluble, but not the problem of evolution, which involves the creation of new genes and their union into vital genotypes. Ikeno has contributed work on factorial analysis which shows its extreme difficulty even with relatively large numbers.—*Helen Deuss Hill*.

3458. SUMNER, F. B. The partial genetic independence in size of the various parts of the body. Proc. Nation. Acad. Sci. [U. S. A.] 10: 178-180. 1924.—This is a criticism of an earlier paper by Castle claiming that genetic factors affecting size in mammals are exclusively general in their action. The author gives data on *Peromyscus* and analyzes Castle's data on rabbits to support the view that effects, though largely general, are to a considerable degree local and specific.—*C. W. Metz*.

3459. TAKEZIKI, YOSINORI. [Inheritance of leaf color in purple rice plants.] (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 1: 37-43. 2 fig. 1921.—The so-called "purple" rice plants are distinguished by their purple leaves, leaf sheaths, glumes, beards, etc.; this color is due to the red anthocyanin present in the epidermal cells. In the F₂ hybrid generation of Husakiti (green) × Murasaki (purple), and Murasaki (purple) × Rokusukegawari (green) the author has observed the segregation of purple and green offspring in the ratio of approximately 27:37. By cultivation of the F₃ offspring as well as by the curve-analysis method, he concludes that purpleness is due to the co-action of 3 hereditary factors.—*Author*. (Courtesy Japanese Jour. Bot.)

3460. TAMURA, OTO. Morphologische Studien über Chromosomen und Zellkerne. [Morphological studies of chromosomes and nuclei.] Arch. Zellf. 17: 131-164. 6 fig. 1923.—(For abstract see Bot. Absts. 13, Entry 3354.)

3461. TERASAWA, YASUFUSA. [The mosaic-flowered variety of *Celosia cristata*.] (Japanese.) Idengaku Zassi [Japanese Jour. Genetics] 1: 55-72. 1 fig. 1922.—(See also Bot. Absts. 13, Entry 2581.)

3462. TSCHERMAK, E. Über Varietäten- und Specieshybriden bei Primeln. [Variety- and species-hybrids of the primrose.] (Summaries in Dutch, English, and French.) Verslag Internat. Tuinbouw-Congres. P. 139-155. Amsterdam, Sept. 17-23, 1923.—This is a study of hybrid-crosses of *Primula veris acaulis* and *Primula elatior* for the purpose of obtaining calycanthic and full forms in various types of coloring.—"The full Calycanthic Primrose," a new type of full flowers hitherto unknown in primroses, was obtained by a new combination. The heredity of shortness and length of the style is discussed, likewise that of fulness and calycanth, and the fecundity in the case of legitimate and illegitimate pollination. Crosses of *Primula veris acaulis*, *P. elatior* and *P. juliae* are also discussed.—(From English Summary.)

3463. UPHOF, J. C. TH. On Mendelian factors in radishes. Genetics 9: 292-304. 3 fig. 1924.—This paper deals with factors for form and color of roots, and length of foliage, in crosses between varieties of summer radishes and between these and the black winter radishes.—Root shape in every homozygous strain depended upon a single factor. In all crosses made, the F₁ generation was intermediate with respect to shape of roots and size of foliage.—In crosses of Long Red (red roots) × Icicle (white roots) and Early White (white) × Early Red (red), the color differences behaved as a monohybrid giving in F₂, 1 red: 2 violet to

purple (easily distinguished from parental forms): 1 white. A cross, Triumph (red-striped roots) \times Early White gave, following self-fertilization in F_1 , an F_2 ratio of 1:1 for the factor R for red striping. The author suggests the possible presence of a lethal factor. White-rooted Icicle \times red-rooted French Breakfast gave in addition to parental types and purple heterozygotes, a small percentage of pink-rooted plants. The author believes a tri-hybrid ratio is involved here. The yellow color of Round Yellow is due to a single factor difference from white, yellow being dominant. Black winter radishes crossed with summer radishes showed the corky tissue around the periphery of the roots of the former dominant over its absence, and black color dominant or nearly completely epistatic over the other colors.—The results indicate that radish varieties are worthy of extensive and intensive genetical analysis.—*Dorothy I. Neff.*

3464. UPHOF, J. C. TH. Pflanzenzüchtung in subtropischen, semi-ariden Gegenden Arizonas. [Plant breeding in subtropical semi-arid regions of Arizona.] Zeitschr. Pflanzenzücht. 10: 9-23. 5 fig. 1924.—Plant breeding is dependent upon different conditions in hot, semi-arid regions than in a moist climate. Dry soil, dry atmosphere, and the tremendous heat which is as high as 105 to 120°F. in the shade during July and August must be considered. Breeding alfalfa, tepary beans and corn are considered. In regard to alfalfa breeding, various tables give (1) percentage of leaves and average green weight per plant, of certain pure lines; (2) harvest of various pure lines per 100 plants; (3) amount of hay of the various cuttings per year; (4) average number of stomata per 16 sq. mm. on upper and lower surfaces of leaves taken from 150 counts; and (5) time in minutes required on upper and lower surfaces of leaves to change color of cobalt chloride paper during transpiration. The latter stands in clear proportion with the number of stomata. A number of pure lines proved, in winter, to be susceptible and others resistant to *Peronospora trifolii*. In crossing the 2 groups, the F_1 proved to be but little attacked by the disease. Among the 345 F_2 individuals there were 96, or 28%, which were susceptible, showing that probably 1 factor is involved. Seed coat color of various types of tepary beans, *Phaseolus acutifolius*, are mentioned, several pure lines have been isolated. A table is given of 5 white seeded pure lines showing the weight of 500 individual beans to be between 80 and 220 mg. No success has been obtained in reciprocal crosses between *P. acutifolius* \times *P. vulgaris*, or *P. acutifolius* \times *P. multiflorus*. Of much importance is the breeding of Papago sweet corn for the South West. Various strains have been isolated and their yields and behavior recorded in lists. In this climate, Papago sweet corn is superior to the eastern varieties.—*Author.*

3465. VRIEND, J. Resistentie-selectie bij Deli-tabak. [Selection for resistance in Deli tobacco.] Mededeel. Deli Proefsta. 33: 3-10. 1924.—Several selections showed marked resistance to the attacks of *Bacterium Solanacearum*. The number of plants infected remained less throughout the season and the number of leaves harvested were greater as compared to the unselected tobacco in tests carried out in different places.—*D. F. Jones.*

3466. VRIES, HUGO DE. Mutationen und Prämutationen. [Mutations and pre-mutations.] Naturwissenschaften 12: 253-260. 1924.—There are 2 phases to every mutation, the invisible change in the idioplasm and the visible change in the characteristics of the organism. The 2nd may follow immediately after the 1st or there may be a long interval between the "pre-mutation" and its visible expression. Numerous cases of the recurrence of the same mutation prove that several generations may intervene. Unsuccessful attempts to produce mutations through environmental changes may have been successful in producing pre-mutations. Parallel mutations in closely related species may be the expression of the same ancestral pre-mutation or they may be separate mutations produced by the 2 species under a common stimulus. There are 3 types of mutations: (1) Regressive (recessive or "loss" mutations). These are not necessarily the result of an actual loss of germ substance but may be due to inactivation. The doubling of 1 or all of the chromosomes at the reduction division (as in the case of *Oenothera*) is seen as a loss mutation since it results from the loss, by the chromosomes, of the ability to separate. Many investigators see in the doubling of the chromosomes the cause of the *Oenothera* mutations. Yet there are 20 to 30 forms with an extra chromosome and only 7 X chromosomes. The doubling is merely an accompaniment of the mutation. (2) Degressive (reverse) mutations or the reappearance of a character previously lost. A review of plant and

animal mutations shows that they fall into these 2 classes with the exception of most of the *Oenothera* mutants. While regressive and degressive mutations are found among the *Oenothera* mutants, most of them belong to the following type. (3) Progressive mutations. The latter differ from their parent forms in a whole group of progressive characters, which are inherited in subsequent generations. In the production of a complex of dominant characters these mutants parallel the process of species-forming in nature and have the greatest scientific interest.—*E. Anderson.*

3467. WEINBERG, [W.] *Vererbung und Aussenfaktoren bei menschlichen Zwillingen.* [Inheritance and environmental factors in human twinning.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 33: 314-316. 1924.—The tendency toward twinning is transmitted by the ♂ to his ♀ offspring. The author thinks that investigations of wide scope show the unmistakable preponderance of the maternal influence and that this is opposed to Davenport's theory holding the influence of the father to be no less than that of the mother. The author thinks Davenport's theory of the influence of lethal factors on the selection of twin germs which are kept alive is basically justifiable, but that his contention regarding the premature decadence of one or both twin eggs or the frequency of the simultaneous occurrence of 2 ripe follicles is not conclusive. He says the frequency of continued 1-egg twin births by the same mother is no greater than that of the 1-egg twin birth. One egg twins are of importance only in connection with the influence of external factors. Twinning also serves to prove polymery.—*Isabelle Watson.*

3468. WEINBERG, W. *Zur Frage der Letalfaktoren beim Menschen.* [Lethal factors in human beings.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 34: 139-140. 1924.—The question of the occurrence of lethal factors in man is not new. That there are such factors is probable as indicated by the author's earlier work. For example, absence of women who are true haemophiliacs may best be interpreted on the assumption that the genes for this trait are lethal when homozygous.—*C. H. Danforth.*

3469. WEISS, F. E., AND D. ROSEN. The supposed constancy of the hybrid between the common and the water avens, *Geum urbanum* × *rivale*. *Nature* 114: 500. 1924.—A summary of previously published experimental data showing segregation in the F_2 generation *Geum urbanum* × *Geum rivale* (sometimes referred to as *Geum intermedium* Ehr.) is cited to refute Blaringhem's assertions that the hybrids between these species retain their hybrid characters during successive generations and are an example of constancy in interspecific hybrids. The authors state that their published data, confirmed by further experiments, show variations in the F_2 as regards inclination of peduncle, presence of anthocyanin in peduncle and calyx, expansion of calyx and size of stipules. Definite segregation in approximating a 3-1 ratio is shown in the yellow color of the flowers and in the form of the petals. Red color segregates in a manner indicating multiple factors.—*J. Ben Hill.*

3470. WETTSTEIN, F. V. *Morphologie und Physiologie des Formwechsels der Moose auf genetischer Grundlage. I.* [Morphology and physiology of form change in mosses upon a genetic basis.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 33: 1-236. *Pl. 1-12, fig. 1-67.* 1924.—From sporophytes of *Amblystegium serpens* 2n gametophytes were obtained by regeneration. Fertilization of 2n eggs resulted in the production of 4n sporophytes, from which, by regeneration, came 4n gametophytes. Regenerative power of fragments of setae varies little with age of sporophyte, increasing somewhat from younger stages to the time of beginning of capsule-formation, then slowly waning. Such fragments, as previously shown by Correns, regenerate more freely from the distal than from the proximal ends. This "polarity" is independent of light and of gravity. Protonemata produced from distal ends grow for a time (to 10-12 cells) more rapidly than those from proximal ends. Illumination and moisture are requisite to regeneration. Comparing n, 2n, and 4n gametophytes, cell size varies with nuclear size and chromosome number; the ratios between these characters vary with external conditions, which produce disproportionate changes in univalent and plurivalent plants. Differences in cell form result from unequal effects of differences in chromosome number upon length, breadth, and (probably) thickness of cells. Cell numbers in corresponding organs vary with differences in chromosome number but in very complex fashion. Form of organs, determined by cell size, cell form, and cell number, is therefore variously modified. Size and

form of chloroplasts are substantially alike in n , $2n$, and $4n$ forms; the number per cell varies with the chromosome number. The spores of univalent races are approximately uniform in size and, with rare exceptions, viable. Those of bivalent races differ greatly in size; many abort. Spores from a single bivalent ($4n$) capsule give rise to numerous distinct races, considered by the author to result from irregularities in chromosome segregation. Quadrivalent races form no sporophytes.—Several genetically distinct races of *Funaria hygrometrica* were isolated. This and other Funariaceae (including *Physcomitrella* and *Physcomitrium*) regenerate readily from capsule parts, never from fragments of setae. By regeneration, bivalent, quadrivalent, and trivalent races were obtained, the latter by regeneration from $3n$ sporophytes produced by the union of $2n$ eggs and n antherozoids. Regenerations were obtained from wall cells of archegonia and from ventral canal cells; efforts to induce regeneration of the egg or parthenogenesis were unsuccessful. Some studies were made of comparative cell sizes, forms, and numbers in univalent and plurivalent races. Synoicous inflorescences are somewhat more numerous in bivalent than in univalent races; they are the rule in trivalent and quadrivalent races. Proportion of inflorescences and sporophytes decreases with increased chromosome number. Bivalent ($4n$) sporophytes produce spores of various sizes, many of which abort. Those which germinate give rise to variously characterized races. Fertilizations were obtained of $n \times n$, $2n \times n$, $2n \times 2n$, $3n \times 3n$; none of $3n \times 2n$, $4n \times n$, $4n \times 2n$, or $4n \times 4n$. Injections of 0.01% chloral hydrate or of 1% KNO_3 into capsules during sporogenesis resulted (according to the time of injection) in a failure of spore-development, an irregular distribution of chromosomes to the spores, the formation of 2 bivalent, instead of 4 univalent, spores from a mother cell, or in the persistent adherence of spores in tetrads. Bivalent spores gave rise to bivalent races. One bivalent race was also obtained by treatment of a univalent protonema with chloral hydrate. Constant aberrant races resulted from bud mutations in univalent and bivalent clones. Four pairs of alternative gametophytic characters and 3 pairs of alternative sporophytic characters are described. The results of crosses indicate complete linkage of 2 gametophytic characters, and of 1 gametophytic character with 2 sporophytic characters. Thus the 7 pairs of characters are provisionally explained as dependent upon 4 pairs of factors. Reciprocal crosses between univalent races differing with respect to all 4 factor-pairs result in uniform sporophytes, showing in general intermediate characters. The gametophytic offspring of these F_1 sporophytes present various combinations of parental characters, the character-combinations of the parents, however, appearing in a majority of cases. There is an indication, therefore, of varied degrees of linkage between all the factors here studied. The characters of each pair appear approximately in the ratio, 1-1. The gametophytic offspring of 35 spore tetrads indicated that each tetrad consists of 2 and only 2 types of spores, from which fact it is concluded that chromosome-segregation occurs only in the heterotypic division. The same conclusion is supported by the fact that of 8 gametophytic offspring of bivalent spores (the homoeotypic division having been inhibited by an injection of chloral hydrate), all were homozygous. In heterozygous races produced by crosses of $2n \times n$ and $2n \times 2n$, the degree of expression of dominant and recessive factors varies according to the number of doses of each present.—Briefer reports are given of experiments with *Physcomitrella patens*, *Physcomitrium eurystomum*, and *P. pyriforme*. Offspring were obtained from crosses of *Physcomitrella patens* \times *Funaria hygrometrica*, *Physcomitrella patens* \times *Physcomitrium eurystomum*, *Physcomitrium eurystomum* \times *Funaria hygrometrica*, *Physcomitrium eurystomum* bivalens \times *Funaria hygrometrica* univalens, *Physcomitrium pyriforme* bivalens \times *Funaria hygrometrica* univalens, *Physcomitrium eurystomum* \times *P. pyriforme*, and *P. pyriforme* \times *P. eurystomum*.—From protonemata of *Bryum caespiticium*, $2n$ races were obtained in consequence of centrifuging, cooling, and treating with chloral hydrate, ether vapor, and chloroform vapor. Since this species is dioicous, both bivalent female (FF) and bivalent male (MM) races can thus be produced. By regeneration from sporophytes, bisexual bivalent (FM) races were obtained. Both eggs and antherozoids of FM plants are functionally sterile. FF eggs, however, were fertilized by M antherozoids, giving trivalent (FFM) sporophytes; and by MM antherozoids, giving quadrivalent (FFMM) sporophytes. From regenerations from these sporophytes came gametophytes of corresponding constitution. FM and FFMM gametophytes are proterandrous; as they grow older, archegonia appear

in gradually increasing proportion. Reverse conditions are found in FFM gametophytes.—The production of bivalent races is reported in a considerable number of other species.—*C. E. Allen.*

3471. WILLETT, W. R. Biometrical methods. *Pennsylvania State Farmer* 16: 228-229. 2 fig. 1923.—Popular discussions are given of biometrical methods with their application to agricultural data, and of methods for the calculation of biometrical constants.—*J. Ben Hill.*

3472. WOLDA, G. Akklimatisierung und Deklimatisierung. [Acclimatization and declimatization.] *Genetica* 5: 497-526. 2 pl. 1924.—This is mainly a study, in cooperation with many other observers, of the egg laying period and its variations, among birds of Holland. The date of deposit of the first egg, the size of the clutch, and also of the first appearance of song were studied in relation to individual species, location of nest, character of season, and character and condition of vegetation near nest. Extensive data and many graphs are given. Birds with 2 broods a year, usually have a 2nd clutch of a smaller number of eggs. The author believes that a species may have the tendency to extend the period covering both broods, and to make the 2 clutches equal. This, extending the breeding period over a greater part of the favorable season, he calls acclimatization. He believes a species may develop the opposite tendency, to shorten the total period and reduce the 2nd clutch in favor of the 1st, until finally only 1 clutch is produced. This is called declimatization. The 1st tendency is favorable, the 2nd unfavorable for the preservation of the race. Other data on the character of nests and colors of eggs in various groups are given. The general conclusion is that the whole group of Oscines (song birds) displays a general tendency first of acclimatization then of declimatization, comparable with youth-maturity-senescence, in an individual. A study of marriages and births in man (including illegitimate, etc.) in Amsterdam over the period 1908-1922 seems to exhibit a similar phenomenon. There was a distinct periodicity of births, best explained by climatic conditions. Periodicity, greatest in young mothers, decreases and almost disappears with age to 30, then gradually increases again. This is believed to be the acclimatization-declimatization phenomenon, parallel to that in birds.—*George Wagner.*

3473. YAMAGUCHI, YASUKE. Etudes d'hérédité sur la couleur des glumes chez le riz. [Studies of the inheritance of glume-color in rice.] *Bot. Mag. Tokyo* 35: 106-112. 1921.—The author describes the results of crossing 2 varieties of rice, "Karasumoti" and "Sinriki," involving the color of the glumes and glumules. They are deep purple in the first variety, and yellowish white in the latter, while in the F_1 hybrid they are a slightly less deep purple than in "Karasumoti." In the F_2 generation the color of glumes and glumules is perhaps shown by 5 types according to the individuals, that is, purple entirely (type A) and only in the 2 ends (type B), entirely brownish red (type C) and only 2 ends (type D), and yellowish white (type E). The individuals of each type are in the proportion 27:9:9:3:16, respectively. To explain this type of ratio, the existence of 3 factors, B , R , and S is assumed, among which B stands for blue, R for entirely red, and S for the latter color in the 2 ends only. The author assumes further, that the action of the 2 factors, B and R , is not expressed simultaneously with S . The results of his experiments have shown that "Karasumoti" is represented perhaps by $BBRRSS$ and "Sinriki" by $bbrrss$. The F_1 hybrid, then, is $BbRrSs$. It is evident theoretically that type A contains 8 sub-types phenotypically alike, but of different genetic constitution. Each of the types B and C contains 4 such sub-types; D, 2; and type E, 9. Self-fertilization and examination of the offspring thus produced confirmed this theory. Concerning type A alone, the author can find but 7 sub-types instead of 8, evidently because of the too few individuals examined. Those lacking are $BBRrSs$. The fact that the type with yellowish white glumes and glumules contains a certain number of sub-types of different genetic constitution, has been proved by examination of the offspring produced by back-crossing with each of the 2 original parents: thus the author has formed the 3 individuals corresponding to the formulas $BBRRss$, $BBRrss$ and $bbrrss$, respectively, and has discovered an association (linkage) between the color of the glumes and glumules and the character of the endosperm. Individuals with deep purple glumes and glumules and those with brownish red cells possess to an exceptional degree amylogenic endosperm while, on the contrary, those with yellowish white cells possess dextrinous endosperm.—*Author.* (*Courtesy Japanese Jour. Bot.*)

3474. ZELENY, C. An expression for the value of a hereditary factor in terms of an environmental equivalent. *Studia Mendeliana*. P. 201-202. Typos: Brünn, Czechoslovakia, 1923.—The writer discusses briefly the results of experiments on the affect of temperature upon the ommatidial number in the eyes of *Drosophila*.—Charlotte Elliott.

HORTICULTURE

F. C. BRADFORD, *Editor*

(See also in this issue Entries 3229, 3369, 3405, 3407, 3411, 3412, 3438, 3440, 3463, 3464, 3613, 3738, 3777, 3806, 3813, 3825, 3851, 3854, 3880, 3941, 3995)

3475. ANONYMOUS. Black and red currants. *Jour. Ministry Agric. Great Britain* 30: 737-744. 1923.

3476. ANONYMOUS. Father of the peanut industry is dead. *Peanut Promoter* 1⁸: 24-29. 1918.—This includes a history of the peanut industry in the U. S. A. and the part played by Thomas B. Rowland, who was the pioneer.—H. C. Thompson.

3477. ANONYMOUS. Fig cultivation. *Jour. Ministry Agric. Great Britain* 30: 1153-1156. 1924.

3478. ANONYMOUS. Growth of Java's cassava industry. *Pharm. Jour.* 112: 465-466. 1924.—The article treats of the development of the tapioca industry in Java, describing the plant and its cultivation, the preparation of the cassava flour, the exports and the economic uses of this valuable food product from the fleshy roots of *Manihot utilissima*, a euphorbiaceous plant indigenous to Brazil. The exports from Java in 1922 were 63,300 tons of cassava flour and 17,800 tons of flake and pearl tapioca.—E. N. Gathercoal.

3479. ANONYMOUS. Problems in lemon pruning. *California Cultivator* 62: 395, 403. 1924.—This article presents answers by citrus growers to a question regarding the bringing of so-called sucker branches into fruiting. "A tree in poor condition, from whatever cause, will produce only poor fruit. A non-bearing type tree will not produce to a profitable extent with the best of care or any method of pruning. A thrifty growing tree will produce fruit up to size, and little will be classed as tree ripe."—C. S. Pomeroy.

3480. ANONYMOUS. Spur pruning of pear trees. *Agric. Gaz. New South Wales* 35: 816. 1924.—Heavy pruning of fruit spurs in the Winter Nelis pear resulted in heavy crops of fruit in trees that had been shy bearers. Ordinary pruning was carried on at the same time.—L. R. Waldron.

3481. ANONYMOUS. Vegetative propagation in the tropics. *Nature* 114: 556-557. 1924.—Reference is made to several papers especially on work in tropical Asia.—O. A. Stevens.

3482. ARMBRECHT. Fünfzige Jahre Deutscher Gladiolenzucht. [Fifty years of German Gladiolus breeding.] *Möllers Deutsch. Gartnerzeitg.* 39: 249-252. 3 fig. col. 1924.—Approximately 50 years ago Pfitzer started breeding Gladioli. About 1890 *Gladiolus Saundersi* and *G. marseillensis* were used in various crosses. Lemoine and Vilmorin, Andrieux and Co., contributed much toward this kind of breeding. Later, *G. primulinus* from East Africa was used as a parent plant, especially by Pfitzer. Descriptions are given of the best blue, orange, yellow, pink, violet and white varieties.—J. C. Th. Uphof.

3483. BATCHELOR, L. D. Walnut culture in California. *California Agric. Exp. Sta. Bull.* 379. 1-91. 1924.—This is a comprehensive treatise on the walnut industry of California. The climatic, soil, and water requirements are discussed at length. Considerable attention is given to descriptions of the several varieties in general use, as well as to the root-stocks and the choice of nursery trees. Culture is considered under the following headings: soil management, cover cropping, irrigation, intercropping, fertilization and pruning. The insect and disease pests include the codling moth and aphids, red spider, walnut blight, melaxuma, and winter injury or die-back. A discussion of the harvesting, curing and packing of walnuts is included, as well as estimates of the average returns which may be expected from California walnut groves. A curve shows the mean weekly growth of Placentia walnuts (expressed as the area of the cross-section).—A. R. C. Haas.

3484. BENTOV, HARMON. A technical treatise on peanuts for the beginners. *Peanut Promoter* 1⁴: 23-25. 1918.

3485. BERRY, S. STILLMAN. *Iris garden notes of 1923*. Flower Grower 11: 14-15, 62-64 *Illus.* 1924.—A review is given of the results with the new iris in California.—A. C. Beal.

3486. BIOLETTI, FREDERIC T., AND H. E. JACOB. *Head, cane and cordon pruning of vines*. California Agric. Exp. Sta. Circ. 277. 1-32. 1924.—The essential features of head pruning are a vertical trunk, high enough to keep fruit off the ground, and a head in which the arms start from the same level at the top of the trunk. The number of arms should be sufficient to furnish the spurs necessary for the number of bunches the vine is capable of maturing. In cane pruning the head is fan shaped, with the plane extending in the direction of the trellis and not in all directions as in head pruning; fewer arms are necessary than in head pruning. Some varieties do not give full crops with head pruning, and with cane pruning have fruit of inferior size and quality. Cordon pruning often overcomes these difficulties. The characteristic of cordon pruning is that it rises a quarter circle to a height of 30 to 40 inches and then extends horizontally to the next vine 8 to 10 feet away. Only vigorously growing vines survive by this method.—A. R. C. Haas.

3487. BOS, H. *Vervroegen van uien door licht aanvulling*. [Forcing onions by light replenishment.] Landbouwk. Tijdschr. 36: 273-279. 1 *fig.* 1924.—In the Division for Seed Control it became advisable to increase the light during short days. Electric lights of 200 and later of 600 candle power were used. Plants were subjected to light at first for 12 hours, and later, for 14 to 15 hours a day. After 1 month onion plants started to produce bulbs.—J. C. Th. Uphof.

3488. CARVER, G. W. *Possibilities offered in the development of the peanut industry*. Peanut Promoter 4³: 51-54. 1921.—A discussion is given of the food value of the peanut.—H. C. Thompson.

3489. COMERFORD, W. E. *The trail of the peanut in China*. Peanut Promoter 4³: 49. 1921.—Peanut growing started in China in the middle of nineteenth century as a result of nuts taken from U. S. A. to China by a missionary. In 1919 over 2,000,000 tons were exported. A large quantity of oil also is exported. The writer describes the primitive methods of culture, curing and preparing for market.—H. C. Thompson.

3490. CRUESS, W. V. *Olive pickling in Mediterranean countries*. California Agric. Exp. Sta. Circ. 278. 1-33. 1924.—In Europe, olive trees are pruned more severely, fertilized more regularly, and bear more regularly than in California, though more European olive districts could use irrigation advantageously. In southern Europe, the olive fly is under only moderate control through the use of sweet arsenical sprays. For this reason, in southern Spain olives for pickling are harvested before full maturity. European varieties not now grown commercially in California, but of promise for ripe pickling are: (1) Spanish varieties—Murcal, Cordovi, Madreleno, Rapasayo; (2) French varieties—Amellan, Picholine and Lucques; (3) Italian varieties—Santa Catarina, Castriciano, and the Agostino. Small olives in California might be utilized for green pickling, coarsely pulped and pitted mechanically for relish or sandwich filler, or the ripe pickled olives pulped and manufactured like green olive relishes. The French lye treatment with strong brine preservation is not recommended. In the Greek process the olives are preserved by 10% salt which forms a heavy brine and is an improvement on the California method. There is considerable demand in Europe for dried, spiced, crushed, canned and sterilized and pickled olives.—A. R. C. Haas.

3491. EASTWOOD, H. W. *Passion-fruit culture on the Tweed*. Agric. Gaz. New South Wales 35: 817-818. 1924.—The possible profitable culture of this plant is discussed. Passion-fruit produces only 1 crop per annum in this locality.—L. R. Waldron.

3492. EBBERSOL, MINNIE. *Native plants in Texas gardens*. House and Garden 46: 83. *Illus.* 1924.

3493. FRASER, SAMUEL. *Filberts and other nuts*. House and Garden 46: 97. *Illus.* 1924.—Methods of culture are given, together with brief descriptions of varieties recommended for the climate of Western New York.—A. C. Beal.

3494. GUERRERO, SALVADOR. *Tratamiento y explotacion de algunas yerbas y arbustos forestales*. [Treatment and exploitation of some forest herbs and shrubs.] México Forest. 2: 75-84. 1924.—A large number of Mexican shrubby and herbaceous plants, especially

those occurring on dry sites where neither trees nor agricultural crops will grow, are of considerable commercial value. Such are guayule (*Parthenium argentatum*), mariola (*P. incanum*), candelilla (*Euphorbia cerifera*), lechuguilla (*Agave heterocantha*), sotol (*Dasylirion* sp.), and gobernadora (*Larrea mexicana*). Unregulated exploitation threatens the extinction of these plants, especially zacaton (*Muehlenbergia gracilis* and *Epicampes stricta*) and guayule. For guayule, a selection system is recommended by which only the mature plants are gathered, the others being left to reseed the ground. Guayule reproduces readily from seed, but not from sprouts, and reaches full maturity (0.6-1.6 m. high) in 15-20 years. The age of greatest financial return is probably somewhat less. Experiments have been made in cultivating guayule, but probably in the wrong kind of soil, as the plants contained only 1% of gum while wild plants contain 9%.—Zacaton should be handled in a similar manner, eliminating fires and pasturing. It yields the maximum return at 9-10 years.—*W. N. Sparhawk*.

3495. HANAKER, S. W. Peanut industry in Portuguese East Africa. Peanut Promoter 41: 40. 1921.

3496. HARRIS, R. A. Pecan culture in California. California Cultivator 62: 191. 1924.—A statement is given of the probable possibilities for pecan growing in California based on the performance of scattered trees in various sections of the state and at Yuma, Arizona.—*C. S. Pomeroy*.

3497. HARTMAN, HENRY. Studies relating to the harvesting and storage of apples and pears. Oregon Agric. Exp. Sta. Bull. 206. 1-32. Fig. 1-2. 1924.—This report deals mainly with results obtained in 1923 with pears and apples grown in the Willamette Valley. A factor in handling pears may be the loss of weight after harvest, due chiefly, apparently, to lack of humidity. Loss of weight is prevented by storing at a relative humidity of 80 to 85%. Bartlett pears picked Aug. 14 lost more weight than those picked Sept. 14. Loss in weight is accompanied by loss in volume. The time required for pears to reach prime condition depends on the time of picking. Anjous of the first picking required 54 days and those of the last picking 26 days, when held at 66°F. Anjou has a long picking season, while Comice has a short season. Anjou should be picked when the pressure-tester registers between 24 and 19 pounds; Comice, 20 to 18 pounds; Winter Nelis, 33 to 29 pounds; Bartlett, 35 to 25 pounds. In handling pears, cool night temperatures may be utilized to lower the temperature before storage. Apples also show a decrease in resistance to the pressure-tester prior to picking but the test is not considered reliable for apples. Grimes shows great increase in size toward the end of the growth period. This variety is usually picked too early in the Willamette Valley. In Jonathans, time of picking may have a bearing on internal breakdown. Early picking (Sept. 17) caused much less injury of this kind than late picking (Oct. 20). Polished fruit loses weight much more rapidly than unpolished.—*C. E. Owens*.

3498. HARTMAN, HENRY. The relation of humidity to the texture, weight, and volume of filberts. Oregon Agric. Exp. Sta. Bull. 202. 1-22. Fig. 1-7. 1924.—The texture, weight, and volume of filberts were found to vary materially with the humidity of the air in which they are stored. As the relative humidity of the air changes, the water content of filberts fluctuates accordingly. This has a bearing upon handling operations. To avoid decay, filberts should be gathered and dried as soon as they fall to the ground. Storage under living room conditions was found satisfactory. It seems best to dry filberts down to a safe water-content and later to freshen them by exposing to higher humidity.—*C. E. Owens*.

3499. HENRY, EVERETT W. Performance of top-worked lemon orchards. California Citrograph 6: 198. 2 fig. 1921.—Records of a number of orange orchards 25 to 30 years old, top-worked on lemon, indicate that this practice may be successful in a district suited to lemon growing and with healthy young lemon trees. Topworking old lemon trees to oranges is considered unwise.—*C. S. Pomeroy*.

3500. HOARE, A. H. Watercress and its cultivation. Jour. Ministry Agric. Great Britain 30: 1147-1153. 2 fig. 1924.—The specialized methods of growing and handling the crops of watercress (*Nasturtium officinale*), of which there are 3 distinct varieties in cultivation, are described.—*M. B. McKay*.

3501. HODGSON, ROBERT W. Present status of the grapefruit industry in the U. S.

California Citrograph 10: 80, 100, 101. 1925.—This is a discussion of the grapefruit industry with especial reference to the present place and future possibilities of the California and Arizona product. Car-load shipments from each of the producing states and the Isle of Pines are given for each of the years 1918 to 1923, with the bearing and non-bearing acreages in each section for 1923. Approximately 46% of the 1923 acreage was classed as non-bearing.

—C. S. Pomeroy.

3502. HOLMES, E. M. The origin of the maltese blood orange. Pharm. Jour. 112: 614-615. 1924.—Extensive inquiry indicates that the blood orange did not originate in India or China and that it was not known during the history of orange cultivation in Italy from the time when the first orange tree was planted at Rome, in the year 1200, until rather recent times. It was figured by Risso in 1818 as a member of the orange family. It is certain that the blood orange is not a product of a bud of the common orange grafted on the pomegranate and though its actual origin is still shrouded in mystery, it probably is a "sport" originating on the red soil of Malta. It is certain that the red-fleshed orange now cultivated in India, South Africa, Australia, America, etc., has been imported from Malta and at the latest not more than 60 years ago. The evidence that the original blood orange was from a "sport" is strengthened by the fact that of the 2 well known varieties of the Malta blood orange, 1, the so called egg-blood orange, is considered a very superior fruit. It originated as a "sport" in 1850.—E. N. Gathercoal.

3503. HOWARD, R. F. The relation of low temperatures to the root injury of the apple. Nebraska Agric. Exp. Sta. Bull. 199. 1-82. Fig. 4. 1924.—Through the use of control apparatus the following conclusions were reached: Individual French crab and seedling apple stocks vary in their resistance to cold. Many of them will be killed or severely injured if exposed to 14°F. for 2 hours in an air chamber. The scion roots of most varieties of apples seem to be hardier than French crab and seedling roots of equal size. Small young roots are more susceptible to cold than large, older roots. The tops of some varieties of apples are more subject to winter injury in the nursery than others. At 7½ inches depth the temperature under bluegrass sod was 2-7 degrees higher in midwinter than that in a clean cultivated plat. The moisture content of the soil did not greatly influence the minimum temperature that was reached in midwinter at several inches below the surface. The dry soil, however, responded more quickly than the wet soil to atmospheric changes. Freezing temperatures were reached somewhat more rapidly in early winter in the dry than in the wet soil. In early spring the wet soil remained at or near the freezing point for 12 days, while the dry soil had a mean temperature of 34°F. If there is less injury to roots in a wet than in a dry soil, it is probably due to the protection afforded by the moist medium and not to higher soil temperatures in the region of the roots. Occasionally the midwinter soil temperature of eastern Nebraska is low enough to kill tender apple roots at a depth of 6 to 12 inches.—T. A. Kiesselbach.

3504. JÄRVINEN, K. K. Die Löslichkeit der Kochkesselmetalle in Speisen. [Solubility of metals of cooking utensils in foods.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 45: 190-191. 1923.—Fruit-juices containing 40% sugar with 1.5% acid are found to dissolve appreciable quantities of metals, especially from enameled and iron kettles. Brass was dissolved only in traces. A 5% NaCl solution showed much less solvent power.—E. E. Stanford.

3505. KAYSER, E., ET H. DELAVAL. Contribution à l'étude des levures de vin. [A contribution to the study of yeasts of wine.] Compt. Rend. Acad. Sci. Paris 179: 295-297. 1924.—A study is made of the Breton variety of grape, which furnishes the Bourgueil wines so celebrated for their perfume.—C. H. Farr.

3506. KOBER, H., UND FR. SEILER. Zusammensetzung und Beurteilung der Moselweine. [Composition and analyses of Moselle wines.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 46: 1-9. 1923.

3507. LOWRY, ROBERT B. The American lotus (*Nelumbo lutea*). Flower Grower 11: 1-5. Illus. 1924.—The history and culture of the plant is given.—A. C. Beal.

3508. LUNDEMO, JOHN R. Value of effective windbreak to citrus orchard. California Citrograph 6: 76, 91. 4 fig. 1921.—A 5000-acre planting of citrus trees made in 1910, 1911,

and 1912 in an open windy area was protected by double-rowed windbreaks every 300 to 600 feet apart. The trees were 8 feet apart in the rows and, in total, equaled a single row 400 miles long. Careful meteorological records kept from the time the ground was cleared have shown a considerable decrease in wind velocity and in wind injury as a result of the windbreaks. Several varieties of eucalyptus were tested but the blue gum, *E. globulus*, making a thick bushy growth, proved the most satisfactory. Root pruning the windbreak trees every other year prevented any appreciable competition with adjoining orchard trees.—*C. S. Pomeroy*.

3509. McMEANS, A. Sidelights on vegetable production. Ann. Rept. British Columbia Fruit Growers Assoc. 33: 33-36. 1922.

3510. McNESS, GEO. T. Improvement of the Spanish peanut. Peanut Promoter 2⁶: 33. 1919.

3511. MAYNARD, LESTER. The peanut industry in Egypt. Peanut Promoter 4⁴: 49. 1921.

3512. MORTON, JOHN J. Avocado culture in Central America. California Cultivator 62: 155, 162, 203, 207. 3 fig. 1924.—This is a 2-part article describing the general conditions under which avocados are grown in Central America. Several large experimental nurseries are in operation where the adaptability of varieties is being studied, the largest one being located at Atlitxco, Mexico. Conditions in Florida and California are so different from those where the avocado is native that it is not possible to predict how an introduced variety will behave in this country. A smattering knowledge of many of the newer agricultural discoveries in culture and genetics is said to have been possessed by the so-called ignorant Aztec Indians.—*C. S. Pomeroy*.

3513. MURRAY, R. P. Tomato growing in British Columbia. British Columbia Dept. Agric. New Hort. Ser. Circ. 65. 1-20. 5 fig. 1923.

3514. OST, JUL. Delphinium hybridum als Treibstaude. [Delphinium hybridum for forcing.] Möllers Deutsch. Gärtnerzeitg. 39: 269. 1 fig. 1924.—Seed are sown in January or February. The young plants are set outside in March or April. Such plants may flower in autumn; when placed in pots they may be forced until the following spring.—*J. C. Th. Uphof*.

3515. OVERHOLSER, E. L., AND L. P. LATIMER. The cold storage of pears. California Agric. Exp. Sta. Bull. 377. 1-56. 1924.—The causes of the spoiling of pears in storage are given as scald, blue mold, internal breakdown, wilting and ammonia fumes. The factors affecting the rate of spoiling in storage are: temperature, degree of maturity at time of harvest, variety, care in handling at harvest and delay in placing in storage, and cross pollination. Pears kept better and longer at 30-32°F. than at 36-45°F., when harvested at the proper stage of maturity. The average maximum storage period of pears picked at the height of the commercial harvest was 141 days at 32°F.; if harvested 2 weeks later, they kept 158 days and suffered less from wilt and scald in storage. Bartlett was the most susceptible to scald and Beurré Hardy least. Columbia, Doyenne d'Alençon, and Seckel were relatively immune to blue mold. The varieties exhibiting the most satisfactory keeping qualities in storage were Doyenne d'Alençon, Lawrence, P. Barry, Forelle, Columbia, Block "18," Vicar of Winkfield, and Winter Nelis. Madeleine, Lawson, and Bloodgood were unsuitable for storage. The storage behavior of each of 43 varieties of pears is presented.—*A. R. C. Haas*.

3516. PALMER, R. C. Fruit storage problems. Ann. Rept. British Columbia Fruit Growers Assoc. 34: 30-32. 1923.—Apples ripened faster in non-ventilated storage than when left out in the orchard but protected from direct rays of the sun. Adequate ventilation delayed the appearance of "Jonathan breakdown" (a very serious trouble in the Okanagan district). Practically no Jonathans picked before Oct. 15th developed breakdown. No connection was found between this trouble and "corky core." The Delicious variety withstood a lower temperature without freezing than Jonathan. Apples once frozen regained their normal appearance when thawed out gradually but froze at a higher temperature the 2nd time. There was as much difference in the keeping quality of apples from different trees grown under the same cultural conditions as between apples from trees grown under different cultural conditions, for example, with clean cultivation, or with vetch or alfalfa cover crops.—*J. W. Eastham*.

3517. PARKER, WILLIAM B. Propagation of the date palm. California Citrograph 6: 37. 3 fig. 1920.—A description is given of a method of rooting date palm offshoots radically different from those used heretofore, whereby it is claimed a larger percentage of the offshoots are saved and they are rooted in a shorter time. Increased light in the propagating house, the use of coarse, well drained rooting material and the maintenance of humid conditions continuously from the time the offshoots are cut constitute the main factors in the new method.—*C. S. Pomeroy.*

3518. PINNOW, JOH. Über die Gewinnung und Zusammensetzung von Fruchtw Wein. [Preparation and composition of fruit wine.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 45: 200-207. 1923.—The article refers mainly to wines of currant and strawberry, [*Ribes* and *Fragaria* spp.].—*E. E. Stanford.*

3519. POPENOE, WILSON. A promising avocado. California Cultivator 62: 125, 128. 1 fig. 1924.—This is the story of the discovery in Amatitlan, Guatemala, in 1916 of a large-fruited avocado tree which when propagated at Miami, Florida, gave promise of being a desirable variety. It was later named Itzamna for the chief deity of the Maya pantheon. It is being tested further in Florida and California.—*C. S. Pomeroy.*

3520. SCHUSTER, C. E. Filberts. Part I. Growing filberts in Oregon. Part II. Experimental data on filbert pollination. Oregon Agric. Exp. Sta. Bull. 208. 1-39. Fig. 1-16. 1924.—Deep, fertile, well drained land is best for filberts. They are not easily injured by frosts. They should be planted at distances of 20 to 25 feet and cultivated as other fruits. Propagation is by layerage. Varieties of filberts are self-sterile; a few are intersterile. For Barcelona pollenizers use White Aveline, Daviana, Du Chilly, and Nottingham. Daviana, Alpha, Clackamas, and Chaperone are the best pollenizers for Du Chilly. One tree in nine provides sufficient pollination. Wild hazel is of no value in pollination of the filbert.—*C. E. Owens.*

3521. SHAMEL, A. D. Cooperative improvement of citrus varieties. (Abstract from article, same title, U. S. Dept. Agric. Yearbook 1919. P. 249-275. 15 fig. [Separate No. 813] [1920].) California Citrograph 6: 141, 186, 199, 220, 222. 7 fig. 1921.—This is a statement of the practical results of studies on the improvement of citrus varieties through bud selection as conducted under the direction of the writer, and of the method through which these results are being adopted in commercial practice by cooperative work with the California Fruit Growers Supply Company.—*C. S. Pomeroy.*

3522. STEPHENS, THOMAS N. Peanuts as a drouth resister. Peanut Promoter 16: 22. 1918.

3523. STERN, J. Moste des Jahres 1922 aus den Weinbaugebieten der Nahe, des Glaus, des Rheintals unterhalb des Rheingaaes, der Lahn, des Rheins und Mains. [Musts of 1922 in the vineyard regions of certain German provinces.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 45: 375-378. 1923.—Comments on the climatic conditions of the grape growing season, and analytical tables are given.—*E. E. Stanford.*

3524. TAYLOR, H. V. Dates of blossoming of apples and pears. Jour. Ministry Agric. Great Britain 30: 645-649. 1923.—Based on 21 years' records, the order of flowering of 23 varieties of apples and 17 varieties of pears in 5 groups, namely, earliest, early, mid-season, late, and very late, is given.—*M. B. McKay.*

3525. TAYLOR, H. V. Dates of blossoming of plums. Jour. Ministry Agric. Great Britain 30: 748-750. 1923.—Based on 21 years' records, the order of flowering of 25 varieties of plums in 4 groups, namely, early, mid-season, late, and latest, is given.—*M. B. McKay.*

3526. TEAGUE, R. M. Imperial Valley pomelo culture. California Cultivator 62: 187. 1924.—This is an account of the development of the grapefruit industry in the Imperial Valley of California where this fruit matures very early and is of high quality.—*C. S. Pomeroy.*

3527. TIEMANN, H. Wie werden Epiphyllum zur Blüte gebracht? [How Epiphyllum may be brought to flower.] Möllers Deutsch. Gärtnerzeitg. 39: 263. 1924.—In the last of August or the beginning of September, after formation of the new growth, plants are given less water; this stimulates the formation of flower buds. When these become visible more water is given. After flowering the plants are given a rest.—*J. C. Th. Uphof.*

3528. TRIMBLE, F. M. The azalea leaf miner (Lepid.; Tineidae). Entomol. News 35: 275-279. 1 pl. 1924.—This insect is the major pest of azaleas in some greenhouses, especially

in those not regularly fumigated. It has not been found to attack other plants and seriously injures only those sorts which are forced in greenhouses, such as *Azalea vervaeiana*, *A. hinodegiri*, *A. grandiflora* and their varieties. A full description of the insect in its various stages is given, and also of the effect on the plant. Hand picking of infested leaves or cyanide fumigation followed by alternate night fumigations with nicotine sulphate is recommended for control.—O. A. Stevens.

3529. VAILE, R. S. Progress report on the Arlington grove experiment. California Citrus graph 6: 44, 66. 3 fig. 1920.—This is a report of studies for 5 years by the California Citrus Experiment Station on a 19 to 25 year old navel orange grove which had been badly neglected. Readily available nitrogenous fertilizers produced marked crop increases the 1st year with lesser increases in following years. Mulching of the soil with alfalfa hay or barley straw showed marked superiority over any other treatment in the 2nd year, both in tree condition and in yields. Masses of fibrous roots developed under the mulches and the physical character of the soil in those areas was greatly improved. However, a mottled leaf condition developed in the 3rd year on both the mulched and the chemically fertilized plats; this trouble increased seriously in the 4th and 5th years. The mulched plats were so seriously affected toward the end of the 5th year that they were plowed deeply and the permanent mulch was abandoned. The unfertilized and manured plats showed no increase in mottling during this period. The chemically fertilized plats gave the greatest yield in the 5th year, showed the greatest increase over the checks for the 5 years, both absolutely and at the least cost per pound; but only the manured plats gave promise of maintaining the trees in a satisfactory condition for a period of years. Results from the use of winter cover crops indicate that where ample nitrogen has been provided from some other source, no immediate value is shown for the cover crop. All evidence indicates that the incorporation of organic matter with the soil is essential to a long healthy life for citrus trees under the conditions of this test. Plats manured and plowed not less than 10 inches deep each spring are a little better in yields and general appearance than those plowed less deeply. Severely pruned trees have produced less fruit in each of the 5 years than comparable trees moderately pruned. Summer cover crops and bi-monthly irrigation produced rather indeterminate results.—C. S. Pomeroy.

3530. VENTRE, JULES. La Vinification en Corse ce qu'elle devrait être. [Wine making in Corsica.] Ann. École Nation. Agric. Montpellier 18: 43-71. No date.

3531. WARNER, H. H. Notes on some of the newer orchids. Gard. Chron. America 28: 75-76. 1924.

3532. WHITNEY, D. J. The olives of Butte county. California Cultivator 62: 221, 224. 1924.—In the foothill section of Butte County, California, the olive is by far the most popular fruit and seems to be especially suited to conditions prevailing there. One of the chief problems in this district is excessive bearing, and fertilization usually does more harm than good by making so many fruits set that they can not attain proper size. The Mission variety is most common but many of these trees are being top-worked because they have overborne. Manzanillos are planted to a considerable extent because they are earlier than Missions. Sevillano is also grown. Cultural operations are described and operating costs stated.—C. S. Pomeroy.

3533. WIEGAND, ERNEST H. Drying prunes in Oregon. Oregon Agric. Exp. Sta. Bull. 205. 1-26. Fig. 1-14. 1924.—Types of driers are discussed. There are 2 general types, namely, natural draft and mechanical draft driers. The proper relation of drying factors, temperature, humidity and circulation of air are more important than the type of drier. Experiments show that the best results are obtained at temperatures of 150-165°F., humidity of 15-30%, and a circulation of 600-750 lineal feet per minute. Other points considered are: sanitation; dipping in lye, hot water, etc., before drying; use of small lug boxes to prevent crushing; and processing and packing the dried product.—C. E. Owens.

3534. WILSON, E. H. Mid-season flowering trees and shrubs. House and Garden 46: 64-65. Illus. 1924.—A selection of plants flowering during the period from July to September is given.—A. C. Beal.

3535. WITTING, A. F. Asiatic groundnuts. Peanut Promoter 14: 44. 1918.

MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See also in this issue Entries 3361, 3380, 3419, 3664, 3802, 3875, 3878, 3954)

3536. ALTONA, T. Over het zoogenaamde "door den boom slingeren" van het hart by *Tectona grandis* L.f. [The so-called "winding through the tree" of the pith of *Tectona grandis* L.f.] (With a summary in German.) *Tectona* 17: 240-246. 1924.—The author finds that the pith in some trees of *Tectona grandis* winds in a spiral line through the trunk, which is accompanied by left-hand spiral grain of the wood fibres and of the bark. The same corkscrew-growth was found in young plants. It is supposed that later on the corkscrew form is filled up by growth in the diameter of the tree.—*Charles Coster*.

3537. ARBER, AGNES. Danae, Ruscus and Semele: a morphological study. *Ann. Bot.* 38: 229-260. 50 fig. 1924.—The phylloclades characteristic of these liliaceous genera were studied, special attention being paid to their anatomy which is fully described and illustrated. The conclusion is reached that the phylloclades are foliar and not flattened axes as is commonly believed. Each represents a prophyll borne on an axis which is subtended by a scale leaf. Axis and prophyll are congenitally fused, the former being so completely subordinated that it has lost its anatomical independence. It may either bear no other appendage after the prophyll or may be responsible for one or more bracts with buds in their axils.—*W. P. Thompson*.

3538. BATTANDIER, J.-A. Note sur quelques cas exceptionnels de pilosisme. [Some exceptional cases of hairs in plants.] *Bull. Soc. Bot. France* 69: 708-709. 1922.—The author reports the presence of hairs on specimens of *Coleostephus Myconis* Cassini, *Leucanthemum Fontanesii* Boiss. & Reut., *Linum corymbiferum* Desf., *Thymus candidissimus* Batt., *Cerastium atlanticum* Durieu, and *Teucrium flavum* L.—*P. A. Young*.

3539. CHAUVEAUD, GUSTAVE. Une question préalable à M. Gravis. [A question from M. Gravis.] *Bull. Soc. Bot. France* 69: 771-776. 1922.—This is an addition to the controversy on the development of *Fagus sylvatica*, *Urtica*, and *Tradescantia*, in which the author prints 4 letters from Gravis.—*P. A. Young*.

3540. DAHLGREN, K. V. OSSIAN. Studien über die Endosperm bildung der Kompositen. [Studies on endosperm formation in the Compositae.] *Svensk Bot. Tidskr.* 18: 177-203. 9 fig. 1924.—Some contributions to the problem of the taxonomic and phylogenetic value of cellular endosperm formation, particularly in the Compositae. Its main result is that *ab initio* cellular endosperm does not characterize all Compositae. The author found this type in *Vernonia* sp., *Cotula turbinata*, *Calendula arvensis*, and probably in *Tripteris Vaillantii*, *Arctotis staechadifolia*, *A. calendulacea*, *Echinops Ritro* and *E. exaltatum*. Endosperm of free nuclei was observed in *Helianthus annuus*, *Dahlia Merckii*, *Dimorphotheca pluvialis*, *Ursinia anthemoides*, *Centaurea dealbata*, *C. scabiosa*, *C. glastifolia*, *Silybum marianum*, *Cirsium arachnoideum*, *Carduus cernuus*, *Arctium tomentosum* and *Mutisia Candolleana*. The author believes that nuclear endosperm is the more primitive type. Though *ab initio* cellular endosperm is not found in all Compositae, it seems to characterize some of the subgroups. Thus the Cichorieae show several instances of it, whereas the Cynareae seem to be characterized by the nuclear type. Several forms of both endosperm types have been described and in some families several occur; but endosperm formation nevertheless has a certain taxonomic value. A well-developed synergid haustorium was found in *Ursinia anthemoides*. The vascular bundles in the ovule of *Echinops Ritro* and *E. exaltatum* is much ramified. A nuclear endosperm in *Eranthis hyemalis* is described and figured.—*O. Heilborn*.

3541. GRAVIS, A. Réponse à M. G. Chauveaud. [Reply to Chauveaud.] *Bull. Soc. Bot. France* 69: 755-759. 1922.—This is another addition to the controversy on the morphology of *Urtica*, *Tradescantia*, *Fagus*, etc.—*P. A. Young*.

3542. GREGER, JUSTIN. Beiträge zur Kenntnis der Samen und Früchte von Ackerunkrauten. IV. Zur Mikroskopischen Charakteristik einiger Polygonum - Früchte. V. Zur Anatomie der Früchte einiger Rumex - Arten. [Seed and fruit of field-weeds; microscopic characters and anatomy of fruit of Polygonum and Rumex spp.] *Zeitschr. Untersuch. Nahrungs-u. Genussmittel* 45: 357-361. Fig. 1-2. 1923.—Fruits of *Polygonum convolvulus*, *P. per-*

sicaria and *P. aviculare* are distinguished as follows. (1) *P. convolvulus*: Epicarp cells with strongly thickened outer and side walls; side walls irregularly contorted and thickened in broad folds, thickening becoming broader toward the periphery; lumen narrowing toward the periphery and averaging $\frac{1}{2}$ the cell width. Warts of epicarp plainly visible in irregularly radial rows. Length of epicarp cells 100 μ , diameter of warts 25 μ . Color of pericarp in section, blackish-brown.—(2) *P. persicaria*: Side walls of epicarp cells evenly thickened, with narrow folds; outer walls thinner than in *P. convolvulus*; lumen nearly regular; aspect of cross-section palisade-like. Warts lacking. Length of epicarp cells 85 μ . Color of pericarp in section, yellowish-brown.—(3) *P. aviculare*. Epicarp-cells like *P. convolvulus*, but with more uniformly thickened side-walls; lumen not narrowed. Warts not striking, radially arranged. Length of epicarp cells 60 μ , diameter of warts 13–15 μ . Color of pericarp in section golden yellow.—Fruits of *Rumex crispus*, *R. acetosella*, and *R. acetosa* are difficult to distinguish by anatomical characters. The form of the epidermal cells of *R. acetosella* can be distinguished plainly without removal of the cuticle; those of *R. crispus* cannot.—*E. E. Stanford*.

3543. HORTON, W. Note on the preparation of herbarium material for histological study. *Ann. Bot.* 38: 404–405. 1924.—Herbarium material, particularly of flowers, may be brought to a surprisingly good condition for histological study by prolonged treatment with weak sodium hypochlorite solutions. Details are given for the subsequent handling of the material.—*W. P. Thompson*.

3544. LAVIALLE, P., ET J. DELACROIX. Caractères de l'endocarpe dans le genre *Euphorbia*. [Characteristics of the endocarp in the genus *Euphorbia*.] *Bull. Soc. Bot. France* 69: 523–527. 3 fig. 1922.—The author illustrates and discusses cross sections of *Euphorbia* pistils. He concludes that the existence of hairs on the endocarp makes more clear the relationship of the Euphorbiaceae to the Malvaceae and some other families.—*P. A. Young*.

3545. LAVIALLE, P., ET J. DELACROIX. Caractères histologiques du pericarpe et dehiscence du fruit chez les Euphorbes. [Histological characteristics of the pericarp and dehiscence of the fruit in *Euphorbia*.] *Bull. Soc. Bot. France* 69: 585–590. 2 fig. 1922.—The author discusses and illustrates the histological characteristics and the dehiscence of the fruit of *Euphorbia segetalis* L.—*P. A. Young*.

3546. LAVIALLE, P., ET J. DELACROIX. Contribution à l'étude du contenu cellulaire chez les Euphorbes. [Study of the cell contents in the Euphorbiaceae.] *Bull. Soc. Bot. France* 69: 805–808. 1 fig. 1922.—The figure represents a section of a nearly ripe fruit of *Euphorbia platyphylla* and shows the structures and contents of the cells.—*P. A. Young*.

3547. LEWIS, FRANCIS J., AND E. S. DOWDING. The anatomy of the buds of Coniferae. *Ann. Bot.* 38: 217–228. 12 fig. 1924.—In *Picea*, *Pseudotsuga*, *Abies* and *Larix* the bud is separated from the older parts of the stem by a thick-walled structure called the crown which consists of a horizontal plate with extensions downwards on the inner side of the vascular ring and upwards into the innermost scales. Below the crown the pith breaks down to form a cavity which with the remains of the crown persists and can be recognized in branches several years old. In the first 3 genera there is no differentiation of dermatogen from periblem, but the pith is formed from a special group of cells some distance behind the apex. In *Larix*, dermatogen, periblem and plerome all rise from a common mass of meristematic tissue. In *Pinus* there is no crown or cavity and no differentiation of the meristematic tissue.—*W. P. Thompson*.

3548. LIGHT, K. E. The ovule and development of the female gametophyte of *Macrozamia Fraseri*. *Ann. Bot.* 38: 337–350. Pl. 10, 26 fig. 1924.—The development of the endosperm conforms to the general type found in gymnosperms. The gametophytic chromosome number is 12.—*W. P. Thompson*.

3549. MAPLETHORPE, CYRIL W. The structure and development of the bark of *Erythrophleum guineense*, G. Don. *Pharm. Jour.* 113: 106. 4 fig. 1924.—The most characteristic anatomical features in the bark of this species are the unusual number and size of the groups of sclerenchymatous cells, the tannin cells arranged in concentric circles, and the ring of pericyclic sclerenchymatous cells associated with occasional groups of sclerenchymatous fibres.—*E. N. Gathercoal*.

3550. MARTIN-SANS, E. Quelques anomalies végétales. [Some plant anomalies.] Bull. Soc. Hist. Nat. Toulouse 50: 209-213. 1922.—The author discusses *Clematis latyroides* Bess., *Viscum album* L., *Negundo fraxinifolium* Moench., *Rubus fruticosus* L., *Carlina acaulis* L., and *Galactites tomentosa* L. with regard to occurrence of opposite and verticillate leaves, variation in lobing of leaves, numbers of leaflets, branching, fasciation, etc. Production in *Viscum* of an abnormal number of branches may be influenced by light intensity which favors more active assimilation and thus accelerates the growth rate.—Neil Hotchkiss.

3551. MARTIN-SANS, E. Sur le polymorphisme floral de l'*Hypericum humifusum* L. [Floral polymorphism in *Hypericum humifusum* L.] Bull. Soc. Hist. Nat. Toulouse 50: 214-227. 1922.—The author gives a review of the history of observations on this species together with descriptions of the inflorescence, leaves, etc., followed by tables showing variation in numbers of petals, etc., occurrence of pentamerous, tetramerous, and heteromerous perianths. An interpretation of the occurrence of pentamerous and tetramerous perianths is given and compared with that of previous investigators.—Neil Hotchkiss.

3552. MOREAU, FERNAND, ET MME. FERNAND MOREAU. Étude morphologique des inflorescences du Houblon (*Humulus Lupulus* L.) [Morphological study of the flowers of the hop.] Bull. Soc. Bot. France 69: 527-536. 1 fig. 1922.—The authors discuss the ramifications of the stems and described and figure the male and female flowers.—P. A. Young.

3553. MUENCH, ERNST. Zur Anatomie der Harzgänge von *Pinus silvestris*. [Anatomy of resin ducts in *Pinus silvestris*.] Bot. Archiv. 4: 195-200. Fig. 1-2. 1923.—The author gives measurements of full and empty resin ducts and describes the artificial swelling and shrinking of the ducts.—William Seifriz.

3554. NICOLAS, G. Notes phytotératologiques. [Teratological notes.] Bull. Soc. Hist. Nat. Toulouse 50: 116-119. 1922.—Notes are given on the following species not included in the 1921-1922 edition of Penzig's catalogue of teratology: *Clematis Vitalba* L., *Adonis flammea* Jacq., *Ranunculus aconitifolius* L., *R. arvensis* L., *Helleborus viridis* L., *Nasturtium silvestre* R. Br., *N. amphibium* R. Br., *Pittosporum Tobira* Ait., *Choysia ternata* Kunth., *Rhamnus Alaternus* L., *Geum urbanum* L., *Asperula galioides* M. Bieb., *Campanula glomerata* L., *Jasminum odoratissimum* L., *Lycium barbarum* L., *Linaria striata* DC., *Orchis mascula* L., *Iris germanica* L., *Euphorbia dendroides* L. Abnormalities listed include variation in number and size of flower parts, fasciations, proliferations, etc.—Neil Hotchkiss.

3555. PFEIFFER, H. Histologische Untersuchungen an den Stämmchen von *Lagenocarpus Dracaenula* Pfeiff. und an den Knollstöcken anderer Sclerieen. [Histological investigations on the stems of *Lagenocarpus dracaenula* Pfeiff, and on the tuberous caudex of other Sclerieae.] Bot. Archiv. 4: 147-153. 1923.—The small stem of *Lagenocarpus dracaenula* shows no cambium ring in the pericycle but exhibits secondary thickening of the type of *Dracaena*.—William Seifriz.

3556. SCHMUCKER, THEODOR. Zur Morphologie und Biologie geophiler Pflanzen. [Morphology and biology of geophilic plants.] Bot. Archiv. 4: 201-248. Fig. 1-48. 1923.—In geophilic plants, parts which in the "normal" plant have a tendency to grow upwards into the air and light (aerophilic, photophilic) turn toward or even enter the earth. Twelve genera were studied. *LAGOTIS stolonifera* is an excellent example of the derivation of runners from inflorescences, since all intermediate stages occur. In *Stachys palustris* it is relatively easy to transform lateral buds into runners. In the dark and with retardation of root development the immediate transformation of the terminal bud of the tubers into a new tuber could be accomplished. As a result of growth in water-saturated muck the roots of *Ipomoea batatas* can be made to develop, vertical, negatively geotropic side roots the anatomy of which indicates the function of pneumatophores.—William Seifriz.

3557. SCHWARZ, M. Ueber Regeneration und Verzweigung der Rhizome einiger Asparagoiden, insbesondere von *Paris quadrifolius*. [Regeneration and branching of the rhizome of some Asparagoids, especially of *Paris quadrifolia*.] Bot. Archiv. 4: 154-180. Fig. 1-18. 1923.—The vegetative shoot of *Paris quadrifolia* is never replaced when lost, but the plant does not therefore succumb. The rhizome continues growing. A lost rhizome bud is replaced, not out from the wound but through growth of latent primordia. Branching of a rhizome is not infrequent and may take place without loss of the growing point. Foliage

leaf primordia occur in the axis of all scale leaves. The loss of the vegetative shoot in *Polygonatum multiflorum* is likewise not replaced. The rhizome does not produce a new foliage shoot until the following year. In *Maianthemum bifolium* a lost foliage shoot is replaced through growth of an axial bud of a scale leaf.—William Seifriz.

3558. SOUEGES, RENÉ. Embryogenie des Typhacées. Développement de l'embryon chez le *Sparganium simplex* L. [The embryogeny of the Typhaceae. Development of the embryo of *Sparganium simplex*.] Compt. Rend. Acad. Sci. Paris 179: 198-200. Fig. 1-26. 1924.—The order of development in the embryo of this plant follows essentially that previously found for *Luzula Fosteri*. In the 2 species the epidermis is set apart by tangential segmentation of the quadrants. The segmentation of the basal cell is however more rapid in *Sparganium simplex*, and there is a more complex differentiation of the cortical initials at the apex of the radicle and of the cells of the root cap.—C. H. Farr.

3559. SUMMERS, F. The study of textile fibers. [Rev. of: MATHEWS, J. MERRITT. The textile fibers: their physical, microscopical and chemical properties. 4th ed. xviii + 1053. p. J. Wiley & Sons: New York; Chapman & Hall: London, 1924.] Nature 114: 421-423. 1924.—The reviewer notes a number of errors.—O. A. Stevens.

3560. VERSLUYS, W. Een djatiboom met ingesneden bladeren. [A teak tree with lobed leaves.] Tectona 15: 263-264. Fig. 9. 1922.—A short description is given of a specimen of *Tectona grandis* with lobed instead of the usual entire leaves.—Charles Coster.

3561. WLODEK, JAN. Próba ilościowego określenie niektórych własności komórk palisadowej liścia koniczyny. [A calculation of certain features of the cells of the palisade tissue of clover leaves.] Acta Soc. Bot. Poloniae 1: 47-52. 1923.—The surface of a leaf of *Trifolium pratense* comprises 5.723 sq. cm. A sq. mm. of this surface contains 4636 cells. The volume of the leaf is 92 cu. mm. The surface of a cell is 3×10^{-3} sq. mm. and the volume is 10^{-5} cu. mm. There are, on the average, 17 chloroplasts in a cell. The area of the chloroplast is 76.76 sq. μ , the volume 67.28 cu. μ , and the weight 6.8×10^{-11} gm. Chlorophyll constitutes 2% of the weight of the chloroplast, and if evenly distributed throughout the chloroplast its molecules are separated by a distance of 0.4 $\mu\mu$. A palisade cell constitutes 8.5×10^6 part of the volume of the leaf. These results give about 25 times as much water in the cells as is actually found.—H. A. Spoehr.

3562. YAMPOLSKY, CECIL. The pneumathodes on the roots of the oil palm (*Elaeis guineensis* Jacq.). Amer. Jour. Bot. 11: 502-512. 2 pl. 1924.—Pneumathodes are produced on the adventitious roots of this species and are organs of gas exchange. They originate like secondary roots but later become modified. There is direct communication between the pneumathodes and the large air chambers in the root, thus allowing for gas exchange between the atmosphere and the interior of the root. Pneumathodes possess a characteristic aerenchymatous tissue. They may be induced to develop on the underground roots in large numbers through excessive moisture. They are a different type of structure from intumescences.—E. W. Sinnott.

3563. YEATES, J. S. The root-nodules of New Zealand pines. New Zealand Jour. Sci. and Tech. 7: 121-124. 4 fig. 1924.—All New Zealand taxads and the Kauri (*Agathis australis*) have on their rootlets more or less spherical lateral swellings, hitherto considered to be due to mycorrhizal fungi or nitrogen-fixing bacteria. Details are given of their morphology and histology, and the suggestion is made that the nodules are water-storing organs. The size of the juvenile leaf in any species is roughly proportional to the size of the nodules, absence of sufficient water-tissue causing leaf reduction. A fungus was present in every species examined, and is probably symbiotic. Evidence for the views expressed is to be published.—H. H. Allan.

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*L. H. TIFFANY, *Assistant Editor*

(See also in this issue Entries 3216, 3283, 3290, 3292, 3304, 3319, 3428, 3657, 3668, 3669, 3671, 3811, 3827, 3828, 3873)

3564. ANONYMOUS. [Rev. of: JOHNSTONE, JAMES, ANDREW SCOTT, AND HERBERT C. CHADWICK. The marine plankton, with special reference to investigations made at Port Erin, Isle of Man, during 1907-1914: a handbook for students and amateur workers. xvi + 194 p. 20 pl. Univ. Press: Liverpool; Hodder & Stoughton: London, 1924.] *Nature* 114: 497. 1924.—"Apart from the data the book gives an admirable account of how a research of this kind is and should be conducted."—O. A. Stevens.

3565. AMOSSÉ, A. Diatomées de la côte orientale d'Afrique. [Diatoms from the east coast of Africa.] *Bull. Mus. Hist. Nat. [Paris]* 30: 109-116. 1924.—This report on the results of examination of material collected at Daressalam, Zanzibar, Aden and Suez covers 55 species and varieties of the genera *Navicula*, *Caloneis* and *Diploneis*. *Navicula Robertsiana* Grev. var. *cuneata* is described as new.—John M. Fogg, Jr.

3566. AMOSSÉ, A. Diatomées de la côte orientale d'Afrique. [Diatoms from the east coast of Africa.] *Bull. Mus. Hist. Nat. [Paris]* 30: 159-166. 1924.—This is a continuation of the report noted in the preceding entry. It treats 34 forms under the "Raphidae," and 38 forms under the "Pseudo-Raphidae," describing 2 new varieties: *Campylodiscus biangulatus* Grev. var. *intermedia*, and *Nitzschia granulata* Grün. var. *hyalina*.—John M. Fogg, Jr.

3567. BELAR, KARL. [Rev. of: WETTSTEIN, FRITZ VON. Zur Bedeutung und Technik der Reinkultur für Systematik und Floristik der Algen. (The significance of pure cultures for the classification and knowledge of algae.) Oesterreich. Bot. Zeitschr. 70: 23-29. 1921 (see Bot. Absts. 14, Entry 1583).] *Arch. Protistenk.* 44: 148. 1921.

3568. CROW, W. B. Some features in the envelope of Coelastrum. *Ann. Bot.* 38: 398-401. 1924.

3569. DELF, E. MARION, AND VIOLET M. GRUBB. The spermatia of *Rhodymenia palmata* Ag. *Ann. Bot.* 38: 327-336. 4 fig. 1924.—Spermatial fronds closely resembling those of sterile or tetrasporic plants were discovered. The sori are in flat irregular patches. They consist at an early stage of numerous antheridial mother cells, each subtended by a basal cell. The mother cell buds off antheridia right and left from its apex. Each antheridium contains a solitary spermatium which is extruded, when ripe, from the torn apex.—W. P. Thompson.

3570. DOFLEIN, F. Untersuchungen über Chrysomonadinen. [Researches on Chrysomonads.] *Arch. Protistenk.* 44: 149-213. Pl. 6-10, 3 fig. 1922.—*Ochromonas granularis* Doflein is described as to food habits, body form, size, which is very variable, behavior and structure under various conditions. Fat and leucosin may be produced abundantly in sugar cultures: then the chromatophores become very small and pale, while in inorganic cultures the chromatophores are large and dark. This throws light on the origin of colorless flagellates. In one case a colorless form was produced by failure of the chromatophore to divide, one of the daughters then inheriting the whole chromatophore and the other none. Binary fission, which takes $\frac{3}{4}$ to 1 hour for completion, is longitudinal, though this is obscured by the amoeboid activity of the body. The chromatophore ordinarily constricts autonomously. The basal granule doubles by simple constriction, and new flagella grow. Strands and fibers of "stereoplasm" extend from the basal granule to the interior, often surrounding the nucleus.—The nucleus possesses a central karyosome, a distinct membrane, and granules of peripheral chromatin. At the onset of division the nucleus, granules and karyosome increase in size. An intranuclear spindle arises from the substance of the karyosome, and the new karyosomes are constructed after mitosis from this spindle. The peripheral granules organize an equatorial plate which splits, and the daughter plates migrate to the poles. There seem to be 2 chromosomes. The karyosome is a "binnenkörper" free of chromatin, which furnishes the kinetic energy of division. The spindle, which is of colloidal substance,

is pointed at the ends, despite the absence of centrosomes and centrioles. The basal granule divides independently and has no influence on spindle formation; secondarily it may appear at the spindle poles. Similar processes are noted in the case of the central granule of *Acanthocystis*, *Spongomonas* and metaxoan cells. This granule cannot be identified with the centriole. Encystment is described.—An account of *Chrysamoeba radians* Klebs is given.

—Harold Kirby.

3571. Еленкин, А. А. [ELENKIN, A. A.] О новом виде синезеленой водоросли из рода *Oncobyrsa* Ag. и положении этого рода в сем. *Chroococcaceae*. [A new species of blue green algae belonging to the genus *Oncobyrsa* Ag. and the place of this genus in the *Chroococcaceae*.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 2: 1-24. 1923.—In addition to the Russian text, Latin diagnoses are given of *Oncobyrsa sarcinoides* (Wisl.) n. sp., *O. sarcinoides* var. *fulvocubica* n. var., *O. sarcinoides* var. *irregulariter-consociata* n. var. and its form *palida* n. f. and *fusca* n. f., and *O. sarcinoides* var. *sparsa* n. var.—Frederick V. Rand.

3572. Еленкин, А. А. [ELENKIN, A. A.] О новом виде синезеленой водоросли *Calothrix Ramenskii* mihi nov. sp. [A new species of blue green algae, *Calothrix Ramenskii* n. sp.] Ботанические материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 1: 6-9. 1922.—In addition to the Russian text a Latin diagnosis is given of *Calothrix Ramenskii* n. sp., found on *Cladophora*, *Nostoc*, etc.—Frederick V. Rand.

3573. Еленкин, А. А. [ELENKIN, A. A.] О новом виде синезеленой водоросли из рода *Aulosira* Kirchn. [A new species of blue green algae from the genus *Aulosira* Kirchn.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 1: 127-128. 1922.—In addition to the Russian text a Latin diagnosis is given of *Aulosira planctonica* n. sp.—Frederick V. Rand.

3574. Еленкин, А. А. [ELENKIN, A. A.] Более редкие и новые десмидиевые водоросли найденные в Олонедкой губ. I, II. [Rare and new desmids from the Olonets province. I, II.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 1: 156-160. 1922; 2: 29-32. 1923.—I. Diagnoses in Russian are given of the following: *Penium cucurbitinum*, Biss. f. *minutissimum* Elenk. n. f., *Closterium didymotocum* Corda var. *Hauptfleischi* Elenk., *C. pseudodiana* Roy. var. *Lütke-mülleri* Elenk., *Eusastrum ansatum* Ralfs f. *majus* Elenk. n. f., and *Micrasterias rotata* (Grev.) Ralfs f. *margaritifera* Elenk. n. f.—II. Diagnoses in Russian of the following are given: *Micrasterias Mahobule-shwarensis* Hobson var. *Wallichii* (Grum.) West and West, *M. denticulata* Bréb., var. *angulosa* (Hantzsch.) West & West, and *Xanthidium armatum* (Bréb.) Rabenh. f. *subfissum* Elenk. n. f.—Frederick V. Rand.

3575. Еленкин, А. А. [ELENKIN, A. A.] О связи между синезеленой водорослью *Nostoc Zetterstedtii* Aresch. и глубоководным лишайником *Collema* (?) *Ramenskii* mihi nov. sp. [The affinity between *Nostoc Zetterstedtii* Aresch. and *Collema* (?) *Ramenskii* n. sp.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 1: 35-46. 1922.—In addition to the Russian text a Latin diagnosis is given of *Collema* (?) *Ramenskii* n. sp.—Frederick V. Rand.

3576. Еленкин, А. А. [ELENKIN, A. A.] Об изменениях в классификации сем. *Chroococcaceae* в классе синезеленых водорослей [Variations in the classification of the family *Chroococcaceae* in the class of blue-green algae.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 2: 49-62. 1923.—(See also following Entry.)

3577. GEITLER, L. [Rev. of: ELENKIN, A. A. Schema *Chroococcacearum* classificationis. (Classification of *Chroococcaceae*.) Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani 2: 49-62. 1923.] Arch. Protistenk. 48: 526-530. 1924.—The author has now extended his systematic studies beyond filamentous Cyanophyceae to the 1-celled forms.

A monograph on this taxonomically difficult algal group is here projected, in which Elenkin divides the Chroococcaceae into the following 3 main groups: (1). Coccobactrae, with the genera *Synechoccus*, *Baculaira*, *Dactylococcopsis*, *Myxobactron*, and *Spirulina*; (2) Gloeococcae planimetrae, comprising forms with flattened colonies and including *Merismopedium*, *Tetrapedium*, and *Holopedium*; (3) Gloeococcae Stereometrae, with cell colonies which arise by division in 3 planes. This group is divided into the Homoeogloae with undifferentiated membrane, and the Heterogloae with distinct membrane. The former comprises the genera *Microcystis*, *Gomphosphareria*, *Coelosphaeriopsis*, and *Pilgeria*. The Heterogloae separate into the Tegumentotenuiores with *Chroococcus* and into the Tegumentocrassiores with the inclusive genus *Gloeocapsa*. Elenkin's scheme of classification is outlined with brief diagnostic details down to subfamilies and subgenera.—*Frederick V. Rand.*

3578. GICKLHORN, J. Notiz über der durch *Chromulina smaragdina* nov. spec. bedigten Smaragdglanz der Wasserspiegels. [Notes on the emerald luster of the water surface caused by *Chromulina smaragdina* n. sp.] Arch. Protistenk. 44: 219-226. 3 fig. 1922.—In masses, this flagellate forms a compact, easily disturbed green film on the water surface. When a portion is removed it appears gray, yellow-brown or rusty red. Examined microscopically, it is found to consist of numerous flagellates imbedded in a gelatinous mass in which there is an accumulation of iron oxide. This Fe_2O_3 is the cause of the brown or red color; the green color of large masses is due to light reflection from the chromatophores. Notes are given on the morphology and systematic position of this new species, *Chromulina smaragdina*.—*Harold Kirby.*

3579. HÄYRÉN, ERNST. Några alger från Göteborgs hamnvatten. [Some algae from the harbor of Gottenborg.] Svensk Bot. Tidskr. 18: 318-319. 1924.—*Phormidium autumnale* plays a prominent role in the inner canals; it is a strong mesosaprobe. *Stigeoclonium*, *Ulothrix*, *Phormidium corium* and *Scenedesmus obliquus*, likewise found in the canals, suggest a weaker pollution. At the mouth of the river the pollution is less, but that it still exists is shown by the presence of *Phormidium autumnale*, *Enteromorpha crinita* and *Ulothrix subflaccida*.—*O. Heilborn.*

3580. KRASSE, G. *Navicula ventralis* n. spec. Bot. Archiv. 4: 248. 1923.—The author describes the new species, *Navicula ventralis*, omitted from a previous publication.—*William Seifriz.*

3581. LINKOLA, K. Kulturen mit Nostoc-Gonidien der Peltigera-Arten. [Cultures of Nostoc gonidia from species of Peltigera.] Ann. Soc. Zool.-Bot. Fennicae Vanamo 1: 1-23. 1 pl., 7 fig. 1920.—Nostoc gonidia derived from the thalli of various species of *Peltigera* and from the cephalodia of *P. aphthosa* were cultivated in water and on solid media. The gonidia grew well and developed hormogonia which in one case produced spores, in others the usual globular Nostoc colonies. All of the cultures gave the appearance of *N. punctiforme* (Kütz.) Hariot. Only the gonidia of *Peltigera malacea* behaved somewhat differently.—*R. Collander.*

3582. Мейер, К. И. [MEYER, K. I.] Новая зеленая водоросль из Сиваша, *Cladophora siwaschensis* Const. Meyer, sp. nova. [A new green alga from Sivash, *Cladophora siwaschensis* Const. Meyer, n. sp.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 1: 15. 1922.—A Latin diagnosis of *Cladophora siwaschensis* n. sp., is given.—*Frederick V. Rand.*

3583. Мейер, К. И. [MEYER, K. I.] Новые виды зеленых водорослей из Байкала. [New green algae from Lake Baikal.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 1: 13-15. 1922.—Latin diagnoses of the following new species are given: *Draparmaldia baicalensis*, *D. simplex*, *D. Goroschankinii*, *D. arenaria*, and *Chaetomorpha baicalensis*. In each case Meyer is the authority.—*Frederick V. Rand.*

3584. PASCHER, A. Neue oder wenig bekannte Flagellaten. XII. [New or little known flagellates.] Arch. Protistenk. 48: 492-508. Fig. 1-19. 1924.—The following 27 spp. of flagellates are described and figured: *Ochromonas vallesiacea* Chodat, *Phaeoglea mucosa* Chod., *Chrysostomum simplex* Chod., *Clathrostomum perlatum* Chod., *Phaeocitrus colliger*

Chod., *Selenophaea granulosa* Chod., *Chrysastrella minor* Chod., *C. breviappendiculata* Chod., *Cryptomonas alpina* Chod., *C. loricata* Chod., *C. rostrata* Chod., *Agloe silvicola* Pascher n. comb. (= *Chlamydomonas silvicola* Chod.), *Chlamydomonas sphaerica* Troitztkaja, *Trachelomonas manchurica* Skvortzow, *T. poltavica* Skvort., *T. spiralis* Skvort., *T. komarowii* Skvort., *T. kelloggii* Skvort., *T. felix* Skvort., *T. arnoldiana* Skvort., *T. rara* Skvort., *T. tuberosa* Skvort., *T. wislouchii* Skvort., *T. tympanum* Pascher n. sp. (= *T. wislouchii* var. *punctata* Skvort.) *T. peridiniformis* Skvort., *Euglena elenkinii* Poljansky, and *Amphitropsis biciliata* Gieckhorn.—R. P. Hall.

3585. PASCHER, A. [Rev. of: CHOLODNY, N. Über die eisengespeichesenden Flagellaten Spongomonas und Anthophysa. (The iron-depositing flagellates, Spongomonas and Anthophysa.) Arch. Soc. Russ. Protistol. 2: 210-219. 1923.] Arch. Protistenk. 48: 517-518. 1924.

3586. PASCHER, A. [Rev. of: KUSCHAKWITSCH, S. Zur Kenntnis der Entwicklungsgeschichte von Volvox. (A contribution to the knowledge of the development of Volvox.) Bull. Acad. Sci. Oukraine 1: 31-36. 1923.] Arch. Protistenk. 48: 523-525. 1924.

3587. PHILLIPS, R. W. On the structure of *Spyridia filamentosa* (Wulf) Harv. and the affinities of the genus. Ann. Bot. 38: 547-562. 1924.—After a discussion of the mode of cortication, the author describes the development of the procarps, the process of fertilization, the formation of cystocarps and carpospores. It is suggested that *Spyridia* be given ordinal position among the Gigartinales.—E. N. Transeau.

3588. РОЛЛ, Я. В. [ROLL, J. V.] Новые виды и Формы десмидиевых водорослей найденные в Архангельской и Олонецкой губ. [New species and forms of desmids from the Archangelsk and Olonetsk provinces.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 2: 36-46. Fig. 1-18. 1923.—Diagnoses of the following are given: *Gonatozygon pilosum* Wolle var. *longipilum* n. var., *Penium capitatum* n. sp., *Closterium capitatum* n. sp., *C. recurvatum* n. sp., *C. abruptum* West var. *angustatum* Schmidle f. *minor* n. f., *C. truncatulum* n. sp., *Triploceras gracile* Bail f. *Kowdensis* n. f., *Pleurotaenium Ehrenbergii* De By. var. *elongatum* West f. *lata* n. f., *P. baculiferum* n. sp., *P. insigne* n. sp., *P. Alexenki* n. sp., *P. semi-undulatum* n. sp., *Tetmemorus laevis* Ralfs var. *major* n. var., *Micrasterias Mahabuleschwarensis* Hobss. var. *Kowdensis* n. var., *Xanthidium antilopaeum* Kütz., var. *polymazum* Nordst. f. *granulata* n. f., *Arthrodesmus incus* Haas. var. *extensus* Andr. f. *minor* n. f., *Hyalotheca verrucosa* n. sp., and *Spondylosium ornatum* n. sp.—Frederick V. Rand.

3589. SCHAEFFER, A. A. [Rev. of: KOFOID, C. A., AND O. SWEZY. The free-living unarmored Dinoflagellata. Univ. California Publ. Mem. Ser. 5. viii + 563. 380 fig. 12 col. pl. 1921 (see Bot. Absts. 11, Entry 1614).] Arch. Protistenk. 49: 139-142. 1924.

3590. SCHULZ, PAUL. Plankton-Desmidiaceen. [Plankton desmids.] Bot. Archiv. 4: 249-262. Fig. 1-42. 1923.—The author lists, describes, and gives the distribution of 68 species and varieties of desmids collected in and near the city of Danzig. Of these the planktons of Sweden contain 13, those of Norway 32, of Finmark 12, of the British seas 27, of Africa 10, and of Australia 17. To this list the author adds 18 species of which the following is new, *Cosmarium margaritatum* (Lund.) Ray. et Biss. f. *divergens* n. f.—William Seifriz.

3591. ШКОРБАТОВ, Л. А. [SHKORBATOV, L. A.] О новом организме из вольвоксовых *Chlamydosphaera Korschikovi* Shkhorbatov nov. gen. et spec. [A new organism of the Volvocales: *Chlamydosphaera Korschikovi* Shkhorbatov n. gen. et sp.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 2: 17-18. 1923.—In addition to the Russian text, a Latin diagnosis of *Chlamydosphaera Korschikovi* n. gen., n. sp., is given.—Frederick V. Rand.

3592. ШКОРБАТОВ, Л. А. [SHKORBATOV, L. A.] Новые разновидности из Оомыцетес найденные в окрестностях г. Харькова. [New varieties of Oomycetes found in the vicinity of Kharkov.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 2: 34-36. 1923.—Latin diagnoses are given of the following: *Saprolegnia monoica*

Pringsh. var. *ocellata* n. var., *S. monoica* var. *tortipes* n. var., *S. variabilis* Mind. var. *Charkoviensis* n. var., *Achlya racemosa* Hildebr. var., *stelligera* Cornu f. *polyspora* n. f., *A. oligocantha* de By. var. *brevispina* n. var., and *Aplanes* Braunii de By. var. *Mindeni* n. var.—*Frederick V. Rand.*

3593. SPANDL, H. Neue Entomostraken und Dinoflagellaten. Ann. Naturh. Mus. Wien. 36: 3-4. 1923.—In addition to diagnoses of 2 new species of Entomostraca and 1 old species of Dinoflagellata, *Ceratium filiforme* n. sp. is described.—*Frederick V. Rand.*

3594. STEINECKE, FR. Limonit bildende Algen der Neide-Flachmoore. [Limonite forming algae of the Neide moor.] Bot. Archiv. 4: 403-405. 1923.—The Neide Moor is situated in the vicinity of Neidenburg near the southern boundry of East Prussia, and is some 40 km. long and 1-2 km. wide. The peat contains pronounced deposits of limonite which were formerly worked. The reddish, slimy, jelly-like iron-ochre-slime is due to *Leptothrix ochracea* Kg. Three types of iron hydroxide formation may be distinguished: (1) Oxidation from the oxygen of the air. On freshly exposed water surfaces a film of iron hydroxide is formed. (2) Oxidation by bacteria. *Leptothrix ochracea*, the typical iron bacterium alone produces the extensive ochre masses. (3) Oxidation by algae. Iron derivatives are formed in the jelly layers of some Schizophyceae, in the armors of many Trachelomonades, and in the membrane of some Closteriums.—The following algae from the Neide moor show more or less iron deposition: (1) Flagellates: *Anthophysa vegetans*, *Cryptomonas ovata*, *Euglena viridis*, etc. (2) Schizophyceae: *Lyngbya ochracea*, etc. (3) Conjugatae: *Closterium Lunula* etc. (4) Confervoideae: *Conferva martialis*, and *Microspora abbreviata*.—*William Seifriz.*

3595. TAYLOR, WM. RANDOLPH. Further notes on British Columbia algae. Rhodora 26: 160-166. 1924.—The author's 1st collections in British Columbia were reported in 1922. (See Bot. Absts. 12, Entry 560.) The present collections (no new spp.) comprise 42 species of Myxophyceae, 23 of Chlorophyceae, 2 of Heterokontae and 1 each of Flagellatae and Rhodophyceae. Comparison of these collections with the alpine algae of the Sarek Mountains studied by K. M. Strøm shows the floras of the 2 districts to be of approximately equal richness.—*Frederick V. Rand.*

3596. ТРОИЦКАЯ, О. В. [TROITSKAJA, I. V.] О новом роде из синезеленых водорослей. [A new genus of blue green algae.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 1: 129-131. 1922.—In addition to the Russian text, Latin diagnoses are given for *Coccopedia* n. gen. and for *C. limnetica* n. sp.—*Frederick V. Rand.*

3597. ТРОИЦКАЯ, О. В. [TROITSKAJA, O. V.] О таксономическом значении зеленой водоросли *Pediastrum integrum* Naeg. [Taxonomic significance of *Pediastrum integrum* Naeg.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Cryptog. Hort. Bot. Petropolitani] 2: 24-29. 1923.—The author considers: *Pediastrum integrum* Naeg. to be a developmental stage of *P. Boryani* (Turp.) Mengh.; *P. integrum* var. *Braunianum* Nordst. and var. *tirolense* Hangs., to be adult forms of *P. Boryani*; and *P. integrum* var. *perforatum* Racib., to be a developmental stage between *P. Boryani typicum* and *P. integrum*.—*Frederick V. Rand.*

3598. WERMEL, E. Neue oder wenig bekannte Flagellaten. XI. Beschreibung neuer Flagellaten aus Russland. [Descriptions of new flagellates from Russia.] Arch. Protistenk. 48: 204-206. 9 fig. 1924.—The following flagellates are described and figured: *Mallomonas quadricornis* n. sp., *M. fusiformis* n. sp., *M. moskowsensis* n. sp., *Euglena sima* n. sp., *Trachelomonas longicollis* n. sp., *Menoidium semilunaris* n. sp., *Menoidium semilunaris* var. *regularis* n. var., and *Menoidium distractum* n. sp.—*R. P. Hall.*

3599. WILLE, N. Karplanter og ferskvandsalger fra øerne Husøy, Ona og Røsholmen paa Nordmør. [Vascular plants and freshwater algae from the Husøy, Ona and Røsholmen Islands in Nordmør.] Nyt Mag. Naturvidensk. 61: 53-59. Pl. 1-2. Kristiania, 1922.—On the 3 islands there are not many localities for freshwater algae, the richest locality being in the freshwater pools on the rocks where the excrement of sea-gulls proves an effective nitrogen source. The author is of the opinion that the freshwater algae are very generally spread by birds.—A complete list of the freshwater algae is given, the following new forms being de-

scribed: *Merismopedia æruginæa* f. *ovata* n. f., *Lyngbya æruginæa-coerulea* var. *borealis* n. var., *Protococcus viridis* var. *minor* n. var.—The giant bacterium, *Hillhousia mirabilis* G. S. W. & Griffiths is refound, and the flagellate, *Thallochrysis Pascheri* Conrad is described, the author being of the opinion that the genus can not be regarded as a member of the Chrysoomonadinæ, and that the relation between the genus *Thallochrysis* and the *Phaeophyceæ* is more like that between *Tetraspora* and the Chlorophyceæ. (For abstract of the portion of this paper on vascular plants see this issue, Entry 3319.)—K. Münster Ström.

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 3188, 3234, 3236, 3239, 3291, 3470, 3793, 3881)

3600. BARTRAM, EDWIN B. New mosses from southern Arizona. *Bryologist* 27: 70-73. *Pl. 11, 12.* 1924.—The author proposes as new, describes, and figures *Tortula Williamsii* Bartr. and *Grimmia gracillima* Bartr., both based on his own material from the Santa Rita Mts. Neither species seems to have close affinities with any previously known type.—E. B. Chamberlain.

3601. BARTRAM, EDWIN B. *Scopelophila ligulata* Spruce in North America. *Rev. Bryologique* 51: 47-48. 1924.—The discovery of *Scopelophila ligulata* in the Patagonia Mountains. Santa Cruz County, Arizona, is announced. This rare species was hitherto known from only 2 localities, both European.—A. W. Evans.

3602. CHAMBERLAIN, EDWARD B. Prof. Holzinger's *Musci-acrocarpi boreali americani*. *Bryologist* 27: 84. 1924.—The article notes the appearance of Holzinger's 21st fascicle of *Musci Exsiccati*, and gives a list of the species included, together with their stations. A misprint on one of the labels is corrected, and a foot-note records the fact that *Andreaea nivalis Baileyi* Holzinger, proposed as a new variety in the exsiccati, has since been raised to specific rank (see this issue, Entry 3606).—E. B. Chamberlain.

3603. CULMANN, P. Contribution à la flore bryologique du bassin supérieur du Salat. [The moss flora of the upper valley of the Salat.] *Rev. Bryologique* 51: 38-47. 1924.—The author concludes his observations on the bryophytes of Angouls and vicinity in the Central Pyrenees of France (see Bot. Absts. 13, Entry 7186), listing 8 species of *Sphagnum* and 228 mosses, with data regarding stations. *Andreaea Huntii* var. *dentata* is proposed as new.—A. W. Evans.

3604. DIXON, H. N. Spitzbergen mosses. *Bryologist* 27: 69. 1924.—In the collection of mosses made in 1923 by C. S. Elton, during the Merton College Expedition to Spitzbergen, the author finds 7 species; one of these, *Pottia lanceolata* (Hedw.) C. M., is new to the island. All of the specimens seem to vary from the more southern forms of the species, and the differences are briefly outlined.—E. B. Chamberlain.

3605. DIXON, H. N., AND A. GEPP. Rehmann's South African mosses. *Kew Bull.* 1923: 193-238. 1923.—Nos. 1-423 of Rehmann's *Musci Austro-Africani* were issued between 1875 and 1877, and Nos. 424-680 in or before 1886. No complete set is known. T. R. Sim drew up a list from 3 partial sets in South African herbaria. This was amplified by specimens found in the British Museum collection and at Kew. In the present paper about 630 of Rehmann's numbers are listed with annotations. Quite a number of new species contained in these exsiccati have not yet been published. The list is followed by corrections of errors regarding Rehmann's "Musci," made by Paris (*Index Bryologicus*, ed. 2), Müller (*Hedwigia* 38: 52-154), and others.—T. J. Fitzpatrick.

3606. HOLZINGER, JOHN M. *Andreaea Baileyi*, n. sp. *Bryologist* 27: 78. 1924.—The author proposes as a new species *Andreaea Baileyi* Holzinger, based on specimens collected by J. W. Bailey in Snohomish Co., Washington. The plant is most closely related to *A. nivalis* Hook.—E. B. Chamberlain.

3607. HOLZINGER, JOHN M., AND EDWIN B. BARTRAM. The case of *Barbula Manniae* C. M. *Bryologist* 27: 79. 1924.—The authors have studied the type of *Barbula Manniae* C. M. from the botanical museum at Berlin, as well as duplicate types preserved in American herbaria.

They find that the material wholly lacks the "Byssus-like mass" described by Müller and that all the specimens are referable to *Tortula arenacea* (Sull.) Culmann.—*E. B. Chamberlain*.

3608. MÖLLER, HJALMAR. A revision of the new species and varieties of *Philonotis* described by N. C. Kindberg from North America. *Bryologist* 27: 74-77. 1924.—The author has critically examined all the American material of *Philonotis* contained in the herbarium of the late N. C. Kindberg. This material includes types of all new species proposed by Kindberg in various publications. It is found that all the Kindbergian species and varieties are, at the most, but forms of previously described species, and that all should be reduced to synonymy; in most cases the material grouped under any one name in Kindberg's herbarium represents mixtures of various species and forms. One new combination, *Philonotis tomentella* forma *brachycarpa* (Kindb.) Möller, based on *Philonotis brachycarpa* Kindb. ms., is made.—*E. B. Chamberlain*.

3609. PEARSON, WM. HY. Notes on a collection of Hepaticae from Mount Elgon, East Africa, made by Dr. G. Lindholm in 1920. *Arkiv Bot.* 19⁵: 1-6. Pl. 1-11. 1924.—The author lists 19 species from the collection made by G. Lindblom, proposing the following as new: *Dicranolejeunea Lillieana*, *Frullania crenuliflora*, *Marchesinia Mölleriana*, *Plagiochila elgonensis*, *P. Lindblomii*, *P. myriocarpa*, *Taxilejeunea Lindblomii*, *T. pulchriflora*, and *T. pusilla*. Each species is accompanied by data regarding localities and, in most cases, by critical remarks. With the exception of *Ptychanthus striatus* (L. & L.) Nees and *Radula Lindbergii* Gottsche the species reported are all endemic to Africa. The plates illustrate the new species and also *Plagiochila sinuosa* Mitt. and *Riccia albomarginata* Bisch.—*A. W. Evans*.

3610. POTIER DE LA VARDE, R. Récoltes bryologiques aux environs de Sousse (Tunisie). [Bryological collections from the vicinity of Sousse (Tunis).] *Rev. Bryologique* 51: 33. 1924.—The author lists 20 mosses and 2 hepatics collected by Buroillet. One moss represents an addition to the flora of Tunis.—*A. W. Evans*.

3611. STEPHANI, FRANZ. *Species Hepaticarum*. Vol. 6. P. 433-448. 1924.—In the preceding instalment of the present volume (see Bot. Absts. 14, Entry 2766) the author began an appendix to the entire work. He here continues this appendix and takes up the following genera in the indicated sequence, the number of species described being given in each case: *Stephaniella*, 1; *Jamesoniella*, 1; *Sphenolobus*, 1; *Cephalozia*, 23; *Nowellia*, 2; *Alobiella*, 2; *Hygrobrella*, 3; *Odontoschisma*, 2; *Adelanthus*, 1; *Marsupidium*, 1; and *Calypogeia*, 6. The treatment of the last genus is incomplete. The geographical distribution of the species is as follows: Europe, 4; Asia, 9; Africa, 5; North America, 3; South America, 9; Pacific Islands (including Australia), 14. The following are apparently described for the 1st time: *Adelanthus humilis* (New Caledonia), *Alobiella armata* (New Guinea), *A. campanensis* (Peru), *Calypogeia annabonensis* (West Africa), *C. confertifolia* (Hawaii), *C. gigantea* (New Guinea), *C. granditexta* (Japan), *C. heterophylla* (Japan), *C. japonica* (Japan), *Cephalozia Andreana* (India), *C. armata* (Mexico), *C. aspera* (New Caledonia), *C. caledonica* (New Caledonia), *C. godajensis* (Japan), *C. grandiretis* (Peru), *C. heterophylla* (Australia), *C. hians* (Ecuador), *C. Iishibae* (Japan), *C. maxima* (Hawaii), *C. otaruensis* (Japan), *C. patentiloba* (Ecuador), *C. setiloba* (Japan), *C. setistipa* (Falkland Islands), *C. trivialis* (Germany), *C. Villaumei* (Madagascar), *C. vittata* (Japan), *Hygrobrella Dusénii* (Tierra del Fuego), *Jamesoniella convoluta* (New Guinea), *Lembidium denticulatum* (New Caledonia), *L. giganium* (New Guinea), *L. surinamense* (French Guiana), *Marsupidium grossitextum* (Australia), *Nowellia caledonica* (New Caledonia), *N. dominicensis* (Guadeloupe), *Odontoschisma cordifolium* (Mexico), *O. grandistipulum* (Hawaii), and *Sphenolobus crispifolius* (East Africa). The following represent new combinations, all having been originally described under the genus *Cephalozia*: *Cephalozia gracillima* (Douin), *C. obtusa* (Culmann), *C. Rappii* (Douin), and *C. vaginans* (Steph.). For the various genera here treated the species now recognized by the author total as follows: *Adelanthus*, 10; *Alobiella*, 15; *Cephalozia*, 156; *Hygrobrella*, 7; *Jamesoniella*, 54; *Lembidium*, 8; *Marsupidium*, 9; *Odontoschisma*, 31; *Sphenolobus*, 32; *Stephaniella*, 3.—*A. W. Evans*.

3612. WHELDON, J. A. Harpidioid Hypna. *Naturalist* 1924: 287. 1924.—Readers are requested to correct a number of errors in the author's "Key to the harpidioid Hypna" (see Bot. Absts. 11, Entry 2678).—*W. H. Burrell*.

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*

J. E. FLYNN, *Assistant Editor*

(See also in this issue Entries 3236, 3239, 3247, 3287, 3427, 3563, 3594, 3690, 3794, 3870, 3894, 3983)

FUNGI

3613. ANONYMOUS. Champignons des Bois (Forest fungi). Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 14: 47-71. 1921.—A non-technical discussion is given of the appearance, general characteristics, poisonous or nutritious qualities, culture, storage, and use for food of various forms in the genera *Amanita*, *Boletus*, *Cantharellus*, *Clavaria*, *Craterellus*, *Hydnum*, *Lactarius*, *Peziza*, *Polyporus*, *Psalliota*, *Russula*, and *Tricholoma*.—J. Kittredge, Jr.

3614. ANONYMOUS. Une Monstrosité Mycologique. [A mycological monstrosity.] Nat. Canadien 51: 50, 51. Pl. 2, 4 fig. 1924.—The specimen appears to be *Ceromyces crassus* Batt. and was collected at Bay St. Catherine, Quebec.—A. H. MacKay.

3615. ANONYMOUS. [Rev. of: BULLER, A. H. R. Upon the ocellus function of the subsporangial swelling of *Pilobolus*. Trans. Brit. Mycol. Soc. 7: 61-64. 1921 (see Bot. Absts. 10, Entry 1355).] Jour. Indian Bot. 2: 267. 1921.

3616. ARTHUR, JOSEPH CHARLES. (Uredinales) Aecidiaceae (conclusion) with additions and corrections to Uredinales. North Amer. Flora 79: 605-668. 1924.—The monographic treatment of the rusts is concluded, the species of the form genera *Uredo*, *Aecidium*, *Peridermium*, and *Caeoma*, whose teleutospores are unknown, being included here. Additions and corrections are given for the Coleosporiaceae and the 1st part of the Melampsoraceae.—H. M. Fitzpatrick.

3617. BEELI, M. Énumération des champignons signalés au Congo belge. [Enumeration of noteworthy fungi of the Belgian Congo.] Bull. Jard. Bot. Etat Bruxelles 8: 67-101. 1922. This is a list of 593 species, representing 326 genera and 42 families, for the most part preserved in the national herbarium with notes. These include *Parodiella melioides* var. *macrospora* Torrend, *Hypocrea rubronigrescens* Torrend, *Sphaerostilbe vanderysi* P. Henn., and *Fomes (Amauroderma) versicolor* Bres.—E. De Wildeman.

3618. BEELI, M. Note sur le genre *Meliola* Fr. Espèces et variétés nouvelles récoltées au Congo. [Note on the genus *Meliola*. New species and varieties collected in the Congo.] Bull. Jard. Bot. Etat Bruxelles 7: 89-160. 1920.—A general synopsis of the genus is given with a key to species based on morphological characters and host relationships. The following new species and new varieties are given: *Meliola bicornis* var. *Milletiae*, *M. desmodiicola*; *M. Funtumiae*; *M. hyptidicola* var. *Wombalensis*; *M. intricata* var. *major*; *M. ipomaeicola*; *M. malacotricha* var. *major*; *M. perpusilla* var. *congoensis*; *M. sakawensis* var. *longispora*; *M. Stevensii*; *M. Trichiliae*; *M. Triumphetae* var. *Vanderysti*; *M. Zollingeri* var. *minor*; *M. Henningsii* (= *M. solanicola* Henn. non Gail.). The author erects the new genus *Meliolinopsis* on *Meliolinopsis megalospora* (Rehm) Beeli (= *Meliola Quercinopsis* var. *megalospora* Rehm.).—E. De Wildeman.

3619. BEELI, M. Notes mycologiques. [Mycological notes.] Bull. Jard. Bot. Etat Bruxelles 8: 3-22. Pl. 1. 1922.—These notes comprise 3 parts. The 1st is a contribution to the mycological flora of the Belgian Congo, the author describing the following new species and varieties: *Meliola bicornis* var. *Tephrosiae*, *M. densa* var. *Convolvuli*, *Schizothyrium congoensis*, *Microthyrium longisporum* var. *congoensis*, *Micropeltis congoensis*, *M. Wildemani*, *M. dubia*, *Triphragmium graminicola*, *Ustilago Hyparrheniae*, *U. ugandensis* var. *macrospora*, *Sorosporium chloridicola*, *S. Aristidae*—*amplissima*, and *S. Panici* var. *Kinshasaensis*.—The 2nd part lists 35 species of the Ustilaginales collected in the basin of the Congo.—The 3rd part is a host index to the smuts of Africa.—E. De Wildeman.

3620. BROWN, W. Two mycological methods. Ann. Bot. 38: 401-404. 1924.—(1) A simple method of freeing fungal cultures from bacteria is given. A fungus which is con-

taminated with bacteria will often, when sown on plain agar, grow away from the bacteria so that all that is necessary in order to obtain a clean culture is to transfer from the growing edge of the colony. If a thin film of bacteria surrounds the hyphae up to the growing tip, a transfer taken from below the surface is always bacteria-free.—(2) A method of isolating single strains of fungi by cutting out a hyphal tip, modeled on that of Edgerton for picking up single spores, is described.—*Margaret Newton.*

3621. BROWN, W., AND A. S. HORNE. *Studies of the genus Fusarium.* Ann. Bot. 38: 379–383. 1924.—This investigation includes the study of 6 strains or species of *Fusarium*. These strains were grown on various media with the following results: (1) When the medium was such as to produce the staling type of growth, the spores were short and of low septation. On a medium which gave the non-staling type of growth, the spores were long and of high septation. (2) With a low carbon: nitrogen ratio the colonies are colorless and rapidly become stale; the spores are short, have low septation, soon become vacuolate and are short-lived. With high carbon: nitrogen ratio, the colonies are colored and do not become stale; the spores are long, have high septation, granular contents, and are long-lived. (3) A rise of temperature increases the staling effect and lowers the septation of the spores. (4) The original 6 strains have now increased to 40 due to the appearance of "saltants." However, since typical members of all the groups can be derived from a single spore parent, it is proposed to create a new species, *Fusarium Blackmani*, for the group of forms in question.—*Margaret Newton.*

3622. BUCHANAN, R. E. *General systematic bacteriology: history, nomenclature, groups of bacteria.* 597 p. Williams & Wilkins Co.: Baltimore, 1925.—"The present volume is the first of a series of monographs in the general field of systematic bacteriology. The data presented have been collected, compiled and annotated largely in connection with courses of lectures in systematic bacteriology given to graduate students in bacteriology at the Iowa State College during the past fifteen years. It is an attempt to bring together material which may prove of value to those who are desirous of knowing the probable nomenclatural status of the various names which have been used in bacterial terminology."—Bacteriological systematists have been long in realizing that separation of species and genera on other than morphological grounds may be entirely valid. Botanical bacteriologists have largely ignored the physiological side, while physiological bacteriologists have in many cases not possessed the background of the systematist.—Mention is made of the work of ENLOWS on "The generic names of bacteria" and of the work of the committees of the Society of American Bacteriologists, on classification and on taxonomy of bacteria.—The 3 main subdivisions of the work are: (1) Classification of the genera and higher groups of bacteria (historical) 1773–1922; (2) codes of nomenclatural application in bacteriology; (3) nomenclatural status of names which have been applied to groups of bacteria higher in rank than species (alphabetically arranged). Under (2) are taken up the nomenclatural rules of Lehmann and Neumann, the international codes of botanical and of zoological nomenclature, the type basis code of the Committee on Botanical Nomenclature of the Botanical Society of America, and suggestions and recommendations of the Society of American Bacteriologists.—A bibliography, and subject and author indexes are appended.—*Frederick V. Rand.*

3623. БУХГЕЙМ, А. Н. [BUCHNEIM, A. N.] *К биологии Uromyces Primulae* Fuck. [On the biology of *Uromyces Primulae* Fuck.] Труды секции по Микологии и фитопатологии Русского Ботанического Общества. Труды Московского Отделения. [Trav. Sect. Mycol. Phytopath. Soc. Bot. Russie. Trav. Div. Moscow] 1: 37–38. 1923.—The author maintains that *Uromyces Primulae* Fuck. is in reality made up of 2 separate species, one living upon *Primula hirsuta* All., the other upon *P. auricula*. Inoculation of the hybrid, *P. pubescens* Jacq. (*P. auricula* × *P. hirsuta*), with aeciospores taken either from *P. auricula*, or from *P. hirsuta* always gave infection. (From French summary.)—*Frederick V. Rand.*

3624. BULLER, A. H. REGINALD. *Researches on fungi.* Vol. III. The production and liberation of spores in Hymenomycetes and Uredineae. xii + 611 p. Fig. 227. Longmans, Green & Co.: New York, 1924.—In the 2nd volume of this work, published in 1922, the Agaricineae were divided into (1) the Aequi-hymeniiferae or Non-Coprinus Type of fruit-body organisation, made up of 5 Sub-types, and (2) the Inaequi-hymeniiferae or Coprinus Type,

made up of 6 Sub-types; and the *Panaecolus* Sub-type was described in detail. In the present volume, 8 more of the Sub-types have been described, leaving 2, the *Plicatilis* and the *Curtus*, for Volume IV.—Chapter 12 treats of the bioluminescence of *Panus stypticus*, a fungus which is remarkable in having 2 physiological forms; one, occurring in North America, which is luminous; and the other, occurring in England and probably throughout Europe, which is non-luminous.—Chapter 13 contains a review of our knowledge of the agarics, and Chapter 14 an account of some observations, carried out in the open in mid-winter, upon the nocturnal discharge of spores from the fruit-bodies of *Pleurotus ostreatus* and *Collybia velutipes*.—Part II is devoted to the rust fungi which, like the hymenomycetes, have been considered from the point of view of the production and liberation of their spores. The author has shown that the phenomena accompanying the development and discharge of basidiospores are exactly alike in the Uredineae and hymenomycetes, thus strengthening the view that these 2 great groups are closely related. He has also described in detail, for the 1st time, his observations on the violent discharge of the basidiospores and aecidiospores of *Puccinia graminis*.—C. S. Gager.

3625. Еленев, П. Ф. [ELENEV, P. F.] О желательности большей полноты сведений, даваемых местными флористическими списками грибов. [The desirability of greater detail in local floristic lists of fungi.] Труды секции по микологии и фитопатологии Русского Ботанического Общества. Труды Московского Отделения. [Trav. Sect. Mycol. Phytopath. Soc. Bot. Russie. Trav. Div. Moscow] 1: 55-79. 1923.—Finding that the facts given in the usual mycological lists are too limited for important scientific conclusions, the author proposes the following definite outline to be adhered to in all explorations of local mycological floras: (1) General information on place and date of collection of the fungus, including geographic, floristic, topographic and ecologic data; (2) data on substratum, including species of host or genus of plant remains, stage of development of host and character of lesion or character and stage of decomposition of plant remains; (3) fungus data, including the intensity of the attack, frequency of the fungus, simultaneous development of more than 1 fungus on the same substratum, stage of development of the fungus, and biological, or other data on the fungus; (4) systematic allocation of the fungi collected, including a connecting up of the perfect stages of Fungi Imperfecti as far as known, and naming of families to which the fungi belong. (From French summary.)—Frederick V. Rand.

3626. Еленев, П. Ф. [ELENEV, P. F.] Попытка дифференциации разложения растительных остатков в связи с их микрофлорой. [An attempt at differentiation of the degree of decomposition of vegetable debris in relation to their fungus floras.] Труды секции по микологии и фитопатологии Русского Ботанического Общества. Труды Московского Отделения [Trav. Sect. Mycol. Phytopath. Soc. Bot. Russie. Trav. Div. Moscow] 1: 81-100. 1923.—Because of lack of detail no important conclusions can be drawn from the usual mycological lists. The author proposes to introduce more detailed information into these lists, first by dividing all vegetable substrata into the 2 main groups of (1) herbaceous, and (2) woody plant remains. The 2nd group is again divided into the 6 subgroups: leaves, branches, trunks, stumps, flowers, and fruits. The stage of decomposition for each group is to be noted. In slowly decomposing woody parts, their age is noted as shown by the bark, and whether attached or fallen. Dead trunks are classified into those in the natural condition, and those which have been hewn. Natural trunks are further divided into those on their roots and those fallen; and the hewn trunks, into those in the open air and those enclosed.—By assembling data as to what saprophytic fungi accompany different degrees of decomposition in plant remains, very precise relations may be found to exist between different phases of decomposition and the accompanying fungus flora. (From French summary.)—Frederick V. Rand.

3627. FALCK, RICHARD. Ueber die Sporenverbreitung bei den Ascomyceten II. Die taktiosensiblen Diskomyceten. [On spore dispersal in Ascomycetes. II. The discomycetes sensitive to touch.] Falek's Mykol. Untersuch. u. Ber. 1: 370-403. 1 pl., 5 fig. 1923.

3628. FALCK, RICHARD, UND OLGA FALCK. Über die Sporenkeimung des Champignons. Neue Untersuchungen zu ihrer Morphologie Physiologie und Oekologie. [Spore germination in fungi.] Falek's Mykol. Untersuch. u. Ber. Beihefte 1: 1-63. Pl. 1-4, fig. 1-15. 1924.

3629. FISCHER, ED. Zur Systematik der schweizerischen Trüffeln aus den Gruppen von

Tuber excavatum und *rufum*. [The taxonomy of the Swiss truffles of the group containing *Tuber excavatum* and *T. rufum*.] Verh. Naturf. Gesell. Basel 35: 34-50. 1923.—The author has studied critically a small group of puzzling closely related forms. Figures and detailed discussions are given. *Tuber lapideum* Matt. is included in *T. excavatum* Vitt. as a subspecies, and both in this subspecies and in the subspecies *typicum* 2 new varieties are named: var. *longisporum* and var. *brevisporum*. *T. fulgens* Quelet is closely related. In like manner *T. rutilum* Hesse is included as a sub-species in *T. rufum* Pico and new varieties are described. *T. nitidum* Vitt. and *T. malacodermum* n. sp. are given as close relatives of *T. rufum*.—H. M. Fitzpatrick.

3630. GADD, C. H. The swarming of zoospores of *Phytophthora faberi*. Ann. Bot. 38: 394-397. 2 fig. 1924.—The conditions favoring the formation and emission of zoospores of *Phytophthora faberi* are suitable temperature, well-aerated water, and light. The presence of light, however, does not appear to be as important a factor with *P. faberi* as has been shown to be the case for *P. arecae* and *P. parasitica*. The age of the sporangia would also appear to be important, the highest percentage of swarmed sporangia being obtained from young cultures.—Margaret Newton.

3631. GHESQUIÈRE, J., AND J. HENRARD. Sphaeriacee nouvelle des feuilles du manioc. [A new sphaeriaceous fungus on the leaves of manihot.] Rev. Zool. Africaine (Suppl. Bot.) 1924: 1-2. Fig. a-d. 1924.—*Mycosphaerella* (*Sphaerella*) *manihoti* n. sp. found on both surfaces of the leaves of neglected manihot at Mayombe in the region of Stanleyville, Belgian Congo.—E. De Wildeman.

3632. GONZÁLEZ, FRAGOSO R. Flora Ibérica—Uredales, Royas de los vegetales Tomo 1. Genero Puccinia. [Flora of the Iberian Peninsula—Uredinales I Puccinia.] Lxxi + 416 p. 208 fig. 1924.—This is an extensive monograph including technical descriptions and illustrations of species. Host and species indices are provided, but an analytic key is lacking.—H. M. Fitzpatrick.

3633. ГУСЕВА, К. А. [GUSEVA, K. A.] К истории развития *Fabraea Ranunculi* Karsten. [The development of *Fabraea Ranunculi* Karsten.] Труды секции по микологии и фитопатологии Русского Ботанического Общества. Труды Московского отделения. [Trav. Sect. Mycol. Phytopath. Soc. Bot. Russie. Trav. Div. Moscow] 1: 39-45. Fig. 1-10. 1923.—The mycelium of *Fabraea Ranunculi*, parasitic on *Ranunculus cassubicus*, is made up of uninucleate cells; the hyphae occupy intercellular spaces and penetrate the host cells by means of haustoria. The pycnidium develops from a knot of hyphae enclosing a cavity. The ends of the fertile hyphae penetrate into this cavity and there give rise to conidia.—The apothecium arises from the stroma by means of a group of ascogones composed of rows of uninucleate cells; the latter form a plexus, and terminate in a multicellular trichogyne.—The ascogenous hyphae grow out of the cells of the ascogone and develop hook-shaped terminations from which the asci arise.—The author states that no pairing of nuclei was seen in the ascogenous hyphae; the trichogyne has no sexual function. (From French summary.)—Frederick V. Rand.

3634. HAUTMANN, F. Über die Nektarhefe *Anthomyces Reukaufi*. [Concerning the nectar-yeast *Anthomyces Reukaufi*.] Arch. Protistenk. 48: 213-244. Pl. 9, 7 fig. 1924.—This fungus is found in the nectar of a number of flowers. After leaving the plants for a few hours in water, having protected them against insects, the author removed the nectar and examined it for fungi. These fungi were cultured in drops on hollowed slides, the medium having been thinned with beer-wort. After some growth had taken place, a pure culture was made in wort-agar. Ten strains were thus isolated. The characteristic form of the fungus in nectar is conditioned by a slight nitrogen concentration, about 0.001%, and a sugar concentration of at least 20% saccharose. In solutions containing 0.5% saccharose and made isotonic with 40% cane sugar solution by the addition of inorganic salts, the cross-formed, band-shoots are produced. Osmotic concentration is, therefore, the conditioning factor. The cross-formed modification is produced by narrow, club-formed cells, in which the protoplast is at the stouter end. This thickened portion of the cell wall is stainable with corallin-soda and congo-red; oil drops and volutin are present in the protoplast. Yeast-formed modifications possess glycogen. Transitional between these modifications is the peptone modification produced by abundance of nitrogen. Two races of the fungi were found. Physiologically the fungus

corresponds to the true yeasts. Small quantities of ethyl alcohol, aldehydes, acids and esters are produced as products of metabolism.—*Harold Kirby.*

3635. HEIM, M. R. Note sur une Urédinée nouvelle. [A new rust.] Bull. Soc. Bot. France 69: 546-547. 4 fig. 1922.—The author describes *Puccinia brigantiaca* n. sp. on *Rhaponticum*.—*P. A. Young.*

3636. HORNE, A. S., AND G. HOWARD JONES. A further contribution to the morphology and physiology of the genus *Eidamia*. Ann. Bot. 38: 351-359. 4 fig. 1924.—*Eidamia tuberculata* n. sp. is described. It differs from *E. acremontoides* in possessing tuberculate macrospores and in its ability to hydrolyse starch, invert cane sugar and decompose peptone.—*Margaret Newton.*

3637. HUSZ, B. The microscopic mycoflora of the High-Tatra and Comitat Szepes. Botanikai Közlemények 19¹⁻⁶: 96-105. 1920-1921.—The fungus flora of the Magos-Tatra, exclusive of hymenomycetes, has already reached a total of more than 1000 species of which 37 are unknown in Hungary.—*Gy. de Istvanfi.*

3638. KAUFFMAN, CALVIN HENRY. *Inocybe* (Agaricales pars.). North American Flora [New York] 10⁴: 227-260. 1924.—A total of 93 species are recognized in North America. The following new species occur: *Inocybe Davisiana*, *I. californica*, *I. Earleana*, *I. nodulosa*, *I. prominens*, *I. alabamensis*, *I. acystidiosa*, *I. ochraceomarginata*, *I. longipes*, *I. substricta*, *I. ovalispora*, *I. insinuata*, *I. rufidula*, *I. pallidobrunnea*, *I. connexa*, and *I. sororia*.—*E. B. Payson.*

3639. КУРСАНОВ, Л. И. [KURSANOV, L. I.] К морфологии Uredineae. [Morphology of the Uredineae.] Труды секции по микологии и фитопатологии Русского Ботанического Общества. Труды Московского Отделения [Trav. Sect. Mycol. Phytopath. Soc. Bot. Russie. Trav. Div. Moscow] 1: 5-21. Pl. 1-2. 1923.—Morphological studies of 4 rusts are reported. (1) In *Gymnosporangium juniperinum* Fr. the primordium of the aecial fructification is ovoid and is developed from a plexus of uninucleate hyphae in the midst of which a gelatinous tissue is differentiated. Beneath this sterile, gelatinous tissue, in the fertile hyphae, binucleate cells first appear. Vertical rows of these cells penetrate into the gelatinous tissue where the terminal cells begin to function as basal cells, that is, to detach chains of aeciospores. Two or three basal cells at the center, more active than the others, detach chains of large thick-walled cells which form the operculum of the peridium. Analogous development occurs in *G. tremmeloides*.—(2) In *Peridermium Strobi* Kleb. (*Cronartium ribicola*) the 1st binucleate cells of the aecial fructification were found to be the basal cells. The operculum of the peridium is formed by the terminal cells of the chains of spores.—(3) In *Aecidium leucospermum* DC. var. *uninucleatum* n. var., upon *Anemone ranunculoides*, the basal cells of the aecidium remain uninucleate and detach uninucleate aeciospores and peridium cells. In the same aecium a few (up to 5%) binucleate spores develop, mostly by a secondary process of nuclear division; but sometimes chains of binucleate spores borne on binucleate basal cells are found. The uninucleate spores germinate as well as the binucleate, and give rise to uninucleate germ tubes.—The host may be infected either by the normal binucleate form or by the author's uninucleate form, but no plant has been found with both at the same time. The uninucleate form has been under observation for 2 years.—In *Chrysomyxa Pirolae* Rostr. (*Uredo Pirolae* Wint.) the binucleate mycelium penetrates up to the growing point of the host, *Pirola rotundifolia*, and progressively infects the developing leaves. When the latter burst from the bud the following spring they appear sound, but the microscope reveals intercellular mycelium and haustoria. The leaves remain in this condition usually until the following spring when uredospores or teleutospores commence to form; then the leaves die.—The uredo fructification on *Pirola* is made up of a flat plexus of binucleate hyphae, the upper vertical cells of which divide into 3 by horizontal division. In this manner are formed the peridial cells above, disjunctive cells in the middle and the spore mother-cells below. From the latter arise the uredospores with their peduncles. (From French summary.)—*Frederick V. Rand.*

3640. MATTIROLO, ORESTE. Contributo alla micologia ipogea della Venezia subalpina. [Contribution to knowledge of subterranean fungi of subalpine Venetia.] Mem. R. Accad. Nazion. Lincei 13: 525-543. 1 pl. 1922.—A new genus of the Hysterangiaceae, *Maccagnia*

Matt., based on one species, *M. carnica* Matt., is figured and described. A total of 26 subterranean ascomycetes and 11 subterranean basidiomycetes is given with notes on various species.—*H. M. Fitzpatrick.*

3641. MATTIROLO, ORESTE. Osservazioni sopra due ipogei della Cirenaica e considerazioni intorno ai generi "Tirmania" e "Terfezia." [Observations on two subterranean fungi of Cirensica with a consideration of the genera *Tirmania* and *Terfezia*.] Mem. R. Accad. Nazion. Lincei 13: 545-567. 1 col. pl. 1922.—A key separating 11 species of *Terfezia* is given. Notes on species of both genera are included, and in most cases the spore is figured.—*H. M. Fitzpatrick.*

3642. MATTIROLO, ORESTE. Un nouveau champignon hypogé du Congo belge. *Scleroderma Bovonei* Matt. [Scleroderma *Bovonei* Matt. a new subterranean fungus from Belgian Congo.] Bull. Jard. Bot. Etat. Bruxelles 8: 23-35. Pl. 2. 1922.—This paper gives a description of the species and a discussion of the value of this and related species as food.—*E. De Wildeman.*

3643. MELIN, ELIAS. Experimentelle Untersuchungen über die Konstitution und Ökologie der Mykorrhizen von *Pinus silvestris* L. und *Picea Abies* (L.) Karst. [Experimental researches on the character and ecology of the mycorrhiza of *Pinus silvestris* and *Picea Abies*.] Falek. Mykol. Untersuch. u. Ber. 2: 73-331. Pl. 1-8. 1923.

3644. MOESZ, G. Mykologiai közlemények IV. [Mycological contributions IV.] Bot. Közlemények 191-6: 44-66. Fig. 1-13. 1920-1921 [1921].—*Dendrophoma didyma* Fautr. and Roum., is made the type of a new genus *Conostroma*. *Phomopsis quercicola* n. sp., *P. daucicola* n. sp., *Phyllosticta atriplicis* Desm., *P. ambrosioides* Thümen. *Septoria allii* n. sp., *S. phlomidis* n. sp., *Acrospermum gregarium* Hazsl., *Fusarium lineare* n. sp., *Spicaria fimetaria* n. sp., *Sterigmatocystis Szurákiana* n. sp., *Urocystis sternbergiae* n. sp., *Sphacelotheca strangularis* (Issatschenko) n. comb., *S. spermophora* (Berk. and Curt.) n. comb., and *Cephalosporium acromonium* Corda are figured and described. Notes on the development of *Pleospora herbarum* are given.—*H. M. Fitzpatrick.*

3645. MOLLIARD, M. Phosphorescence présentée par le bois de peuplier. [Phosphorescence observed in poplar wood.] Feuille Naturalistes. N.S. 1: 21-22. 1924.—Cultures made from disintegrating poplar wood in which phosphorescence had been observed developed rhizomorphs similar to those of *Armillaria mellea*.—*H. M. Fitzpatrick.*

3646. MURRILL, WILLIAM ALPHONSO. Agaricaceae (pars). Agariceae (pars). North American Flora [New York] 104: 227. 1924.—The treatment of the genus *Hebeloma* is completed. *Hebeloma cubense* is described as new.—*E. B. Payson.*

3647. OVERHOLTS, LEE ORAS. *Pholiota* (Agaricales pars.). North American Flora [New York] 104: 261-276. 1924.—A total of 48 species are recognized in America. The following new species and new combinations occur: *Pholiota terrestris*, *P. Schraderi* (*Stropharia Schraderi* Peck), *P. furcata*.—*E. B. Payson.*

3648. WEIDMAN, FRED D., AND WALTER FREEMAN. India ink in the microscopic study of yeast cells. Jour. Amer. Med. Assoc. 83: 1163-1164. Fig. 1. 1924.—The authors suggest a new technique for demonstrating yeast cells by emulsifying upon the slide a loopful of culture material into a drop of India ink. The mucinous coating is beautifully brought out while the eyes are also rested during the prolonged examination of an otherwise glaring field, the yeast cells standing out brightly against the dark background.—*W. B. Day.*

LICHENS

3649. BOULY DE LESDAIN, M. Notes lichénologiques. XIX. [Notes on lichens.] Bull. Soc. Bot. France 69: 766-770. 1922.—The author describes the following as new *Calicium pulsillum botryocarpum* n. f., *Icmadophila ericetorum pruinosa* n. f., *I. ericetorum* var. *stiptata* n. var., *Nephromium parile reagens* n. f., *Caloplaca italica* n. sp., *C. Meylani* n. sp., *Caloplaca* (*Blastenia*) *Maïrei* n. sp., *Leaconora subcenisia* n. sp., *Lecidea lactea* var. *intermedia* n. var., and *L. contigua* var. *nigrescens* n. var.—*P. A. Young.*

3650. MALME, GUST. O. Lichenologiska notiser 35-41. [Lichenological notes 35-41.] Svensk Bot. Tidskr. 18: 312-318. 1924.—The distribution of *Pannaria rubiginosa* (Thunb.) Del. is given. It is, in Scandinavia, a western species requiring much rain. The species

distributed in the author's exsiccati as No. 620 is *Pertusaria faginea*, not *P. velata*. *Cladonia coccifera* (L.) Willd. var. *asotea* (Ach.) has been found in Uppland and Västmland; *Caloplaca obscura* (Lahm.) Th. Fr., in Västergötland; *Rhinodina atrocinnerea* (Dicks.) Arn., near Stockholm; *Pannaria nebulosa* (Hoffm.) Nyl., in Scania and Västergötland; the apothecial stage of *Pertusaria faginea* (L.) Leight, in Västergötland; and *Bacidia bistorina* (Koerb.) Vainio, in several places in Sweden.—O. Heilborn.

3651. TIMKÓ, GY. Adatok Lengyelország zuzmóflórájához. [The lichen-flora of Poland.] Botanikai Közlemények 19¹⁻⁶: 84-88. 1920-1921. [1921].

BACTERIA

3652. ANONYMOUS. [Rev. of: LÖHNIS, F. Life-cycles of bacteria. Pt. 1. Review of the literature (1838-1918). Nation. Acad. Sci. Washington 16: 1-252. 41 pl. 1921.] Nature 109: 252-253. 1922.

3653. AWERINZEW, S. Bacterienstudien I. [Studies of bacteria.] Arch. Protistenk. 49: 84-103. Pl. 6, 4 fig. 1924.—These studies of intestinal bacteria found in a species of beetle (*Rhagium*) appear to indicate that bacteria correspond in structure to other Protista—having a protoplasmic body and a nucleus. Certain factors may operate to hinder the discovery of the nucleus. There are 3 types of nuclei, according to the amount of albuminous substance present. The last type does not take nuclear stains. The bacteria likewise differ in plasmic inclusions. A physiological investigation would be very desirable. Bacteria are classified among Protista, and, while an isolated group, they are coordinate with the other groups.—Harold Kirby.

3654. BAERWOLF, FRITZ. Über teratology. Wuchsformen und Granulationen d. Säurefesten, besond. d. Tuberkelbazillen. [Teratological growth forms and granulations of acid fast bacteria, especially the tubercle bacillus.] Dissertation, Univ. Leipzig. 31 p. [Gustav Fock: Leipzig,] 1921.

3655. GÁL, ANDREAS. Erfahrungen bei der Untersuchung des Wassers auf Colibakterien. [Experiences in investigation of colon bacteria in water.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 46: 37-43. 1924.—After inoculation into various types of water, and in competition with water-bacteria, *Bacillus coli* was found to maintain itself better at 10° than at 26° or 37°C. At the higher temperatures other organisms tended to crowd out *B. coli* in water or on agar-plates.—E. E. Stanford.

3656. MASSEY, A. B. A study of *Bacillus aroideae* Townsend, the cause of a soft rot of tomato, and *B. carotovorus* Jones. Phytopathology 14: 460-477. Fig. 1-3. 1924.—The 3 organisms were compared in parallel cultures as to their physiological reactions to certain carbohydrates and as to their ability to infect a large number of fleshy fruits and other plant parts. The inoculations were made by needle pricks into otherwise sound plants or plant parts. In the culture studies the carbohydrate to be used was dissolved and sterilized in distilled water and then diluted to the desired concentration by the addition of sterile peptone solution. Comparisons were made as to the amount and nature of the growth and as to the production of acid and gas in the cultures. *Bacillus aroideae* and the tomato organism behaved similarly in all cultures and in all parasitism tests, and were considered identical. *Bacillus aroideae* and *B. carotovorus* differed in growth on and fermentation of certain carbohydrates and in their ability to parasitize certain species of plants. They should be retained as distinct species. In the fermentation of dextrose, lactose, galactose, saccharose, and mannitol, *B. carotovorus* produced both acid and gas while *B. aroideae* produced acid without gas from these substances. On ethyl alcohol media, *B. carotovorus* produced a heavy pellicle of growth and both acid and gas. *B. aroideae* produced poor growth with no pellicle and no acid or gas on these media. In the parasitism tests, the reaction of *B. carotovorus* was positive on Iris but negative on Calla, kohlrabi, and cauliflower, while that of *B. aroideae* was negative on Iris but positive on the 3 other plants.—B. B. Higgins.

3657. PASCHER, A. [Rev. of: CHOLODNY, N. Über Eisenbakterien und ihre Beziehungen zu den Algen. (The iron-bacteria and their relation to the algae.) Ber. Deutsch. Bot. Ges. 40: 326-346. 6 fig. 1922. (see Bot. Abstr. 12, Entry 4234).] Arch. Protistenk. 48: 518-521. 1924.

3658. PASCHER, A. [Rev. of: CHOLODNY, N. Zur Morphologie der Eisenbakterien *Galionella* und *Spirophyllum*. (The morphology of the iron-bacteria *Galionella* and *Spirophyllum*.) Ber. Deutsch. Bot. Ges. 42: 35-44. 2 fig. 1914.] Arch. Protistenk. 48: 516-517. 1924.

3659. PASCHER, A. [Rev. of: GICKLHORN, J. Zur Morphologie und Microchemie einer neue Gruppe der Purpurbakterien. (The morphology and micro-chemistry of a new group of purple bacteria.) Ber. Deutsch. Bot. Ges. 39: 312-319. 2 fig. 1921 (see Bot. Absts. 12, Entry 6509).] Arch. Protistenk. 49: 137-138. 1924.

3660. ROTHIER, W. Untersuchungen über den Doderleinschen Scheidenbazillus. [Investigation of the Doderlein bacillus.] 27 p. Dissertation, Univ. Erlangen. 27 p. [Gustav Fock: Leipzig,] 1921.

3661. SPREITZER, HERM. Vergleichende Untersuchungen üb. neuere Färbemethoden für Tuberkelbazillen. [Comparative studies of new staining methods for tubercle bacilli.] Dissertation, Univ. Jena. P. 458-461. [Gustav Fock: Leipzig,] 1921.

3662. VIERLING, KARL. Morpholog. u. physiol. Untersuch. über bodenbewohnende Mykobakterien. [Investigation of the morphology and physiology of earth inhabiting Mycobacteria.] Dissertation, Univ. Heidelberg. 22 p. 1 pl. [Gustav Fock: Leipzig,] 1921.

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. BERRY, *Editor*

(See also in this issue Entries 3193, 3322)

3663. ARSÈNE, G. ET PIERRE MARTY. Sur quelques empreintes de feuilles fossiles de la Loma del Zapote Morelia, Michoacan, (Mexique). [Several impressions of fossil leaves of the slope of Zapote Morelia, Michoacan, Mexico.] 16 p. Fig 1-8. Covington, Louisiana. 1923.—The paper records leaves of *Quercus lanceolata* H.B.K., *Quercus acutifolia* Nee, and *Quercus fulva* Liebm. associated with *Elephas* remains from tuffaceous beds of Pleistocene age at Morelia, state of Michoacan, Mexico.—E. W. Berry.

3664. BAILEY, I. W. The problem of identifying the wood of Cretaceous and later dicotyledons: *Paraphyllanthoxylon arizonense*. Ann. Bot. 38: 439-452. Pl. 15. 1924.—A review of the evidence shows that there is no reason for considering that internal structure is more conservative than external floral and foliar characters or vice versa. The main lines of evolution in the xylem in the dicotyledons are quite evident and are briefly described. In general they have not paralleled the evolutionary specialization of the flower, for primitive vascular conditions are found in various representations of the Metachlamydeae, and very specialized ones occur in most orders of Archichlamydeae. Similar types of vascular structure are found in plants which are placed by systematic botanists in widely separate genera, families, and orders. Therefore the construction of keys for distinguishing the woods of many of the larger groups is a very difficult task. Many orders exhibit so many different stages in vascular specialization that it is doubtful whether there are any diagnostic characters which are constant in each group as a whole. Therefore the only method of determining the affinities of a fossil wood is to search for a similar combination of anatomical characters in extant dicotyledons; even when this is found there is uncertainty as to whether the combination is confined to that group. These difficulties are illustrated by reference to a silicified wood from the Cretaceous of Arizona.—W. P. Thompson.

3665. CARPENTIER, ALFRED. Sur des fructifications de Pteridospermées provenant du Westphalien du nord de la France. [The fruits of the Pteridosperms from the Westphalien of northern France.] Compt. Rend. Acad. Sci. Paris 179: 570-572. 1924.—Beds very rich in *Sphenopteris obtusifolius* have been studied. In these are found very small seed, cupules and microsporangia. The seed are referable to *Lagenospermum Kidstoni* Arber. The microsporangia are apparently those of *Telangium*. *Sphenopteris striata* is found in other places associated with similar reproductive structures. It is concluded as formerly that these leaves, seed, and microsporangia belong to one and the same plant, as is also the case with *Sphenopteris obtusifolius* and its associated seed and microsporangia.—C. H. Farr.

3666. CHAMBERLAIN, CHARLES J. The origin of the Cycads. *Science* 61: 73-77. 1925.—The author discusses the relationship of the true ferns, the Paleozoic seed ferns, the fossil cycadeoids and the modern cycads and advances reasons for considering the fossil cycadeoids and the cycads as of independent origin from the Paleozoic seed ferns (Cycadofilicales, Pteridosperms).—*E. W. Berry.*

3667. CHANDLER, M. E. J. The geological history of the genus *Stratiotes*: an account of the evolutionary changes which have occurred within the genus during Tertiary and Quaternary Times. *Quart. Jour. Geol. Soc. London* 79: 117-138. *Pl. 5-6, fig. 2.* 1923.—This genus of the Hydrocharitaceae has a single existing Eurasian species. Its geological history, represented by 8 fossil species, extends back to the upper Eocene. The author carefully describes the seed of the existing species, discusses the evolutionary changes in the ancestral line and the relationships involved, and describes and figures the extinct forms and the fossil occurrences of the existing form. *Stratiotes headonensis*, *S. neglectus* and *S. acuticostatus* are described as new. A bibliography of 73 titles is appended.—*E. W. Berry.*

3668. DOUVILLE, H. Un nouveau genre d'Algues calcaires. [A new genus of calcareous alga.] *Compt. Rend. Sommaire Soc. Géol. France* 16: 169-170. *Fig. 5.* 1924.—The author describes *Solenomeris O'Gormani* n. gen. & n. sp. from the lower Eocene of Béarn near Pau in southwestern France. The genus shows resemblances to *Solenopora* of the Paleozoic, *Solenoporella*, *Metasolenopora* and *Petrophyton* of the Mesozoic, and to various existing and Tertiary Lithothamniaceae, but the cells are much coarser in *Solenomeris*.—*E. W. Berry.*

3669. FRITEL, P. H. Sur des restes de végétaux fossiles paléozoïques recueillis en Ouadäi par la mission du Lieutenant-Colonel Grossard. [Paleozoic fossils from Ouadäi (Libya).] *Bull. Mus. Hist. Nat. [Paris]* 30: 117-118. 1924.—This reports a study of a series of fossil remains from the region of the Libyan plateau, referable to *Lepidodendron*, *Ulodendron*, and *Bothrodendron*, and which contain material identified as *Spirophyton*, a fossil Alga of the extinct group *Alectoruridae*.—*John M. Fogg, Jr.*

3670. GATTEFOSSÉ, JEAN. Quelques plantes alimentaires préhistoriques de Provence. [Some prehistoric food plants of Provence.] *Bull. Soc. Bot. France* 69: 595-601. 1922.—The author considers the following plants: *Triticum turgidum gibbosum*, *T. vulgare*, *Vicia sativa* L., *Vigna nilotica* Hook., *Phaseolus vulgaris*, *Dolichos Lubia*, and *Cajanus indicus* L.—*P. A. Young.*

3671. GEITLER, L. [Rev. of: CROW, W. B. A critical study of certain Cyanophyceae from the point of view of their evolution. *New Phytol.* 21: 81-102. *Fig. 1.* 1922 (see Bot. Absts. 12, Entry 1126).] *Arch. Protistenk.* 49: 138-139. 1924.

3672. GOTHAN, W. Palaeobiologische Betrachtungen über die fossile Pflanzenwelt. [Paleobiological considerations on the fossil plant world.] *Fortschritte Geol. u. Palaeont.* 8: 1-178. 26 fig. 1924.—This is an attempt at a summary of the present status of paleobotany, especially from the point of view of what might be called paleoecology. The subject is treated under the following headings: Dependence of animals on plants and the concordance of their evolution; principles of determining the environment of fossil floras; edaphic and climatic criteria derived from fossil floras; growth rings; plant geography and climate; shifting of the poles and fossil floras; polar night and the plant world; and considerations on the biological relations of fossil floras. This last is taken up under the following sub-headings: Precarboniferous, especially Devonian floras, Carboniferous floras; climate of the Carboniferous; the Gondwana flora; Permian and early Triassic floras; late Triassic and Jurassic floras; and the browncoal flora, especially of Germany.—*E. W. Berry.*

3673. GOTHAN, W., AND W. HAACK. Ruhrkarbon und Osnabrücker Karbon. [Ruhr and Osnabrück Carboniferous.] *Zeitschr. Glückauf* 26: 1-7. *Fig. 1-3.* 1924.—The authors describe the lithology, faunas and floras in the 4160 foot boring at Ibbenbüren near Osnabrück in Westphalia. Twenty-two Carboniferous plants are listed from the boring and lists are also given of the Ibbenbüren and Piesberg fossil floras and correlations are made with the Ruhr field.—*E. W. Berry.*

3674. HAYASAKA, ICHIRO. A new locality of *Gigantopteris* in Southern China. *Bull. Geol. Soc. China* 3: 31-35. *Pl. 1.* 1924.—The author describes and figures fine specimens of *Gigantopteris dentata* Yabe from the mining district of Tao Chung, Anhui, southern China.

This species occurs elsewhere in China at a horizon supposed to be early Triassic, but the present occurrences may be as old as late Permian.—*E. W. Berry.*

3675. HOLMES, S. J. Age and area in relation to extinction. *Science* 61: 77-79. 1925.—The author discusses the inadequacy of the hypothesis, especially with respect to extinction of species, and concludes that the extension of range of one species must be considered to take place at the expense of one or more competing forms, and this correlation is not taken into account by the theory.—*E. W. Berry.*

3676. KRYSHTOFVICH, A. N. A cone of an extinct spruce from the northeastern extremity of Asia. *Rec. Geol. Committee Russian Far East* 32: 1-7. *Fig. 2.* 1924.—The author describes 2 specimens of cones as *Picea anadyrensis*, said to be related to the existing *Picea breweriana* and *P. canadensis*. The age is probably Pleistocene and the occurrence is in tundra country, 150 km. from recent forests, on the Zolotoe Dno River in the basin of the Bielaya River, just south of the Arctic circle in Anadyrland.—*E. W. Berry.*

3677. Любимцев, А. А. [LUBISHCHEV, A. A.] О форме естественной системы организмов. [The form of the natural system of organisms.] *Известия Биологического Научно-Исслед. Инст. при Пермском Университете* [Bull. Inst. Recherches Biol. Univ. Perm] 2: 99-110. 1923.—The author says that, contrary to Bergson's opinion, one has the right to say that evolution is proved in great part through probability (not for the higher taxonomic units); but in questions of systematics one cannot name its language; it is completely vain for questions of systematics and morphology. Therefore it is vain for taxonomists to follow the lines of evolution. As Radl shows, the system can be based on Plato or on Darwin and Spencer together; it is an illusion to base ones conclusions here on Darwin's philosophy; the system must be constructed by advancing from evolutionary structures. The next problem is to find parameters of species and to dispose on these parameters abstracted characteristics in a rational system. This was pointed out in 1898 by the "prophetic thought" of Schiaparelli.—*V. Lashevsky.*

3678. MEZ, CARL. Bemerkungen zur Phylogenie der Algen und Pilze. [The phylogeny of algae and fungi.] *Bot. Archiv* 5: 109-113. 1924.—If the point of view that the quiet and not the motile stage of algae is the primary one holds, then the development of the main trunk of the plant kingdom progresses without pronounced gaps from the Palmellaceae by way of the Ultrichaceae to the Coleochaetaceae and from these to the Archegoniates. The Flagellata, on the other hand, represent a pleiophyletic annex to this algal ancestral tree. The fungus line of the Thallophyta, whose origin is to be seen in the Oomycetes, could only first have come to land after the branching off of the Musci from the Algae, and probably much later, since the development of the fungi would be dependent upon the presence of plants living in air. The fungus line has nothing to do with bacteria. The Schizophytes have produced but one line, namely, to the Palmellaceae. Cytologic and sero-diagnostic investigations point to this conclusion.—*William Seifriz.*

3679. RUTTEN, L. On the occurrence of *Halimeda* in Old Miocene coast reefs of East Borneo. *Proc. Akad. Vetensch. Amsterdam* 23⁴: 560. 1920.—The author records remains of *Halimeda* in the raised reefs, of Oligocene age, along the coast of eastern Borneo.—*E. W. Berry.*

3680. SEWARD, A. C. On a new species of *Tempskya* from Montana: *Tempskya Knowltoni*, sp. nov. *Ann. Bot.* 38: 485-508. *Pl. 16-17. 3 fig.* 1924.—The specimen on which the new species is founded is probably from the Kootenay formation, Lower Cretaceous, of Montana. It is a "false stem" consisting of a mass of diarch branching roots enclosing slender solenostelic stems which bear usually on the same side 2 series of alternate contiguous leaves. The stems show frequent dichotomous branching and increase in number upwards from the narrow end of the obconical specimen. The majority show 1-2 horseshoe-shaped meristeles in addition to the solenostele. The leaf traces arise as loops of the solenostele and pass out alternately right and left to the petioles. A piece of root believed to be Araucarian was found among the roots and also a few groups of thickwalled cells which are probably the apical annuli of Schizeaceous sporangia. The whole specimen is believed to have lain obliquely in the soil, small end down, a few of the branches bearing crowded leaves near the ground level.—*W. P. Thompson.*

3681. YABE, H., AND S. SHIMIZU. Stratigraphic sequence of the lower Tertiary and Upper Cretaceous deposits of Russian Saghalin. Japanese Jour. Geol. & Geogr. 3: 1-12. 1924.—This paper contains summary characterizations of the geological formations of the coalfield west of Alexandrowsk River with lists of the fossil plants and other fossils in the various formations.—*E. W. Berry.*

PATHOLOGY

FREDERICK V. RAND, *Editor*

LILLIAN C. CASH AND HARRY BRAUN, *Associate Editors*

(See also in this issue Entries 3142, 3148, 3152, 3154, 3176, 3200, 3287, 3288, 3344, 3345, 3363, 3364, 3365, 3366, 3367, 3372, 3375, 3395, 3403, 3411, 3419, 3421, 3438, 3452, 3464, 3465, 3483, 3498, 3503, 3515, 3516, 3528, 3529, 3554, 3622, 3623, 3624, 3625, 3626, 3633, 3635, 3639, 3648, 3756, 3759, 3764, 3767, 3806, 3818, 3819, 3845)

DISEASES CAUSED BY FUNGI

3682. ANONYMOUS. The prevention of bunt in wheat. Jour. Ministry Agric. Great Britain 30: 710. 1923.

3683. ANONYMOUS. Trials of potatoes for immunity from wart disease, 1923. Jour. Ministry Agric. Great Britain 30: 1170-1173. 1924.—As a result of the 1923 trials, 18 additional varieties of potatoes have been added to the Ministry's list, approved as immune from wart. Of these 1 is early, 2 are second early and 15 are late or main crop varieties. Descriptions of the varieties are given.—*M. B. McKay.*

3684. BIRMINGHAM, W. A. Another fungus attacking cotton (*Sclerotinia* sp.) Agric. Gaz. New South Wales 35: 797-798. 2 fig. 1924.—This species is thought perhaps to be *S. libertiana*. No previous record is known of *Sclerotinia* appearing upon cotton. Certain control measures are recommended.—*L. R. Waldron.*

3685. CHAUVEAUD, GUSTAVE. Un Noyer attaqué par l'*Agaricus melleus*. [A walnut tree attacked by *A. melleus*.] Bull. Soc. Bot. France 69: 706-707. 1922.—The author found *Agaricus melleus* killing a walnut tree in his yard.—*P. A. Young.*

3686. ELLIOTT, JOHN A. Tomato wilt and its control in Arkansas. Arkansas Agric. Exp. Sta. Bull. 194. 1-11. Pl. 1-5. 1924.—This is a non-technical discussion of tomato wilt (*Fusarium lycopersici*), its symptoms and its control, together with the results of 6 years of experimental trials of various wilt resistant strains. Trials were conducted in large numbers and in most of the counties. It is concluded that wilt can be successfully controlled in Arkansas by the use of the following varieties: Delaware Stone Cross (originated by T. F. Manns), Delaware Stone, Marvel, and Norton (U. S. Dept. Agric. selections), Edgerton's Red Hybrid, and Arkansas' Stone selection. It is suggested that the wilt-resistant property may be correlated with drouth resistance and that this may explain the excessive vegetative growth of certain wilt-resistant strains under extremely wet conditions.—*H. R. Rosen.*

3687. GIBBS, WILHELM. Veränderungen der Brandanfälligkeit durch äussere Bedingungen. [Influence of external conditions upon smut attack.] Jour. Landw. 72: 111-124. 1924.—The experiment shows that temperature and moisture are very important in the spread of smut.—*F. M. Schertz.*

3688. Goss, R. W. Potato wilt and stem-end rot caused by *Fusarium eumartii*. Nebraska Agric. Exp. Sta. Res. Bull. 27. 1-83. Pl. 1-9. 1924.—The author concludes that in Nebraska the potato disease known as wilt and stem-end rot is caused by the widely distributed organism, *Fusarium eumartii*. The disease has been present in Nebraska in serious proportions for many years, though the organism has not been previously reported from this state. The disease results in decreased germination of infected seed tubers, wilt and barrenness of infected plants, decreased yields, and a high percentage of stem-end rot tubers. This tuber infection may increase and do great damage in storage. Affected tubers are also easily invaded by secondary parasites which enter through the infected tissue at the stem end. Isola-

tion studies showed that the organism could usually be recovered from stolons and infected tubers still attached to the plant, except from the most advanced portions of the discolored tissue which were usually sterile. Isolations, to be dependable, should be made from material fresh from the field and preferably from the roots, rather than from stored tubers. In liquid cultures it was determined that the organism produces a thermolabile toxic substance capable of causing the wilt of potato tops placed in the filtrate, in from 30 minutes to 2 hours. It is believed that this substance, in addition to other toxic substances probably produced by the decay of the host tissue, may be partially responsible for the wilting of infected plants. It was also found that a thermolabile toxic substance was produced in liquid media, which was capable of causing maceration of potato tuber tissue in 2-5 hours. This substance is probably responsible for the discoloration and decay of the host tissue in advance of the organism. Pathogenicity studies showed the organism to be a very virulent parasite capable of producing a rapid wilt of the plant and a stem-end rot of the tuber; 100% infection was usually obtained by both soil and seed inoculations except at extremely unfavorable temperatures. Field experiments showed that the amount of disease resulting from inoculated seed could be correlated with environmental conditions. The disease was found to be transmitted by stem-end rotted and internally discolored seed tubers. The type of discoloration in the seed could not be correlated with the organisms isolated nor with the percentage of resulting disease. The infested soil was found to be one of the chief sources of inoculum. Healthy seed on infested soil yielded about the same as infected seed on non-infested soil. Temperature was found to be a greater factor than relative humidity in relation to storage rot. The organism is not capable of penetrating the sound epidermis of a mature tuber. The disease can be partially controlled by the selection of healthy seed and the use of long rotations on infested soil, or by the use of new potato soil. The amount of stem-end rot in the tubers can be reduced by digging infected fields before tuber infection has occurred. The storage rot can be held in check by temperatures below 10°C. with a relative humidity as low as can be maintained without causing serious shrinking. A comparison of *Fusarium eumartii* and *F. oxysporum* and the diseases they produce is given.—T. A. Kiesselbach.

3689. HEALD, F. D. Oat smuts of Washington. Proc. Washington State Grain Growers, Shippers & Millers Assoc. 1919: 28-34. 1919.—This is a popular paper on loose smut (*Ustilago avenae*) and covered smut (*Ustilago levis*) of oats. A careful study of the geographical distribution of the 2 species in Washington shows that covered smut predominates in eastern Washington while in western Washington both are present in about equal amount. The actual percentage of smut was determined for a large number of fields, the results showing that the maximum percentage of smuts was sufficiently high to cause a heavy loss, but a large number of fields were either free or with only small traces. Time of seeding was found to be an important factor in the percentage of infection. Varietal tests on resistance to covered smut gave complete immunity for Kherson and Texas Red and nearly complete smutting for the 2 hull-less varieties.—Lillian C. Cash.

3690. HEALD, F. D., AND L. W. BOYLE. The menace of silver-leaf. Proc. Washington State Hort. Assoc. 19: 50-54. 1923.—Silver-leaf or silver blight due to *Stereum purpureum* is present in the Spokane Valley in considerable amount. It is widely distributed, occurring in England and various European countries, South Africa, New Zealand, and in Canada from Newfoundland to British Columbia. The symptoms are described. The brown or dark discoloration of the heart wood in which the fungus mycelium is located is one very characteristic feature. Infection is followed by a general decline in vigor of particular limbs or of the entire tree, during which time the fruiting bodies of the fungus occur upon the surface of the bark at first as a flat or completely prostrate, faintly purplish growth, circular or irregular in form. With a plentiful supply of moisture these increase in size and become more or less raised or shelf-like and irregularly lobed, while the purple color of the spore-bearing surface becomes more pronounced. Death of the infected parts or the entire tree may ensue.—The usual pruning away and burning of infected wood and protection of pruning wounds with coal tar or Bordeaux paint is recommended.—Lillian C. Cash.

3691. MILBRATH, D. G. Powdery mildew of grapes. California Cultivator 62: 69. 1924.—Popular descriptions are given of this disease and of the life history of its causal fungus, *Uncinula nector*, with methods for its control.—C. S. Pomeroy.

3692. MONTEITH, JOHN, JR. Relation of soil temperature and soil moisture to infection by *Plasmodiophora brassicae*. Jour. Agric. Res. 28: 549-562. Pl. 1-5. 1924.—Experiments were conducted with cabbage seedlings under controlled conditions in the greenhouse to determine the effect of soil temperature and soil moisture content on the development of clubroot. Different types of naturally infested soil were used and were maintained constantly at given temperatures and moisture content throughout the experiments. These were kept in the same greenhouse, under the same light, air temperature and other environmental conditions. Clubroot developed at all temperatures from 9° to 30°C, and seemed to be directly correlated with development of host tissue, the optimum temperature for host development giving the largest clubbed roots. The conclusion is that temperature does not directly limit the development of the disease under field conditions. Soil moisture was found to be an important factor. Clubroot developed in soil maintained at a moisture content of 60% or more of the water-holding capacity, but did not develop in soil kept at 45% of the water-holding capacity. Injury to the plants increased with an increase in soil moisture above 60%. The plants are, however, able to grow well in soil with only 45% moisture. Failure of the disease to develop in soil with a low moisture content is probably due to insufficient moisture for spore germination. Under conditions of excessive soil moisture secondary decay of the diseased roots becomes an important factor in checking growth. It is thought that the influence of these 2 factors, especially soil moisture, may account for some of the conflicting reports on the use of lime in controlling clubroot.—*Author*.

3693. MORQUER, R. La maladie de l' "Encre" du chataignier. [Ink disease of chestnut.] Bull. Soc. Hist. Nat. Toulouse 50: 255-299. Fig. 1-2. 1922.—The ink disease of chestnut is caused by one of the Saprolegniaceae, *Blepharospora cambivora* Petri, which passes part of its life cycle as a saprophyte. Infection is centered mostly in the larger roots. Reproduction does not take place in the tissues of the mature chestnut, but only in dilute mineral salt solutions and on the humus of the chestnut plot. Artificial inoculation reproduced the disease. It is limited to the region which receives moist winds from the ocean, and its distribution is affected less by the chemical than by the physical composition of the soil. Notes are given on the chemical treatment, and on the possibility of substituting disease-resistant varieties of chestnut.—*Neil Hotchkiss*.

3694. MURPHY, PAUL A., AND R. MCKAY. The development of blight in potatoes subsequent to digging. Jour. Dept. Lands & Agric. (An Roin Tailte Agus Talmhaiochta) [Ireland] 24: 1-14. 1924.—Blight (*Phytophthora infestans*) does not spread in stored tubers. Its development is the result of infection previous to storing. Potatoes should be dug at a sufficient interval after the death and removal of the stalks. Most of the blight in stored potatoes appears within 15 days after storing, the rest within a month. *P. infestans* is capable of independent existence in the soil for a limited period in the autumn, but the amount present gradually decreases and finally disappears. No evidence for persistence or hibernation in the soil was found.—*Harry Braun*.

3695. OCFEMIA, GERARDO OFFIMARIA. The Helminthosporium disease of rice occurring in the southern United States and in the Philippines. Amer. Jour. Bot. 11: 385-408. Pl. 22-27. 1924.—The *Helminthosporium* disease of rice, caused by *H. oryzae*, occurs in the East Indies, the Philippines, China, Japan, India, Italy and Louisiana. Various strains within the species differ morphologically and physiologically. The severity of the disease varies in different places. It occurs as leaf-spots, seedling and leaf blight, and as infections of culms, sheaths and glumes. Conidia are borne apically on knee-like projections from aerial conidiophores which occur singly or in fascicles. The fungus sporulates sparingly on artificial media, but may be induced to do so by irritation of the mycelium or by partial desiccation. The temperature range for the species is approximately 16-40°C., with optimum at 28°C. The best vegetative development on agar was obtained at pH 8.6-8.8. The fungus overwinters as dormant mycelium on palea, lemma and ovary walls. So far as known, no perfect stage is produced. Conidia are carried by the wind and cause secondary infection on all parts of the rice plant through its entire life history. On account of the semi-saprophytic habit of the fungus, sanitary measures, properly carried out, will aid in reducing sources of infection in the field. Certain varieties of rice seem more resistant than others. Infec-

tion may be reduced by seeding in soil at a temperature of about 36°C. If the water temperature is 24–28°C., submerging the soil in water to a depth of about 10 cm. seems to prevent infection.—*E. W. Sinnott.*

3696. OCFEMIA, GERARDO OFFIMARIA. The relation of soil temperature to germination of certain Philippine upland and lowland varieties of rice and infection by the *Helminthosporium* disease. *Amer. Jour. Bot.* 11: 437–460. 4 pl. 1924.—Several varieties of rice were grown in Wisconsin soil-temperature tanks. They emerged in 2.0–2.5 days at 36°C., 2.0–3.0 days at 32°, 2.0–5.0 days at 40°, 3.0–3.5 days at 28°, 5.0–5.5 days at 24°, and 8.0–9.0 days at 20°, when the soil moisture was 16–68.4% of the water-holding capacity of the soil. When the soil moisture was increased to 100%, emergence at 20°C. was delayed 4.0–5.0 days; at 24°, 4.0–4.5 days; at 28°, 3.5–4.0 days; at 32°, 0.5–1.5 days; at 36°, 1.0–1.5 days; and at 40°, 1.0–4.0 days. Soil sterilization had little effect upon rate of germination. The influence of seed-borne parasites on germination is considerable at soil temperatures of 16–24°C., but much less above this. Inoculation experiments with *H. oryzae* on rice demonstrate that seedlings are infected at soil temperatures of 16–36°C. The development of lesions on the aerial parts of rice is much faster at 28–32°C. because of the rapid growth of the fungus and of rice seedlings at these temperatures. Severe blighting of seedlings before emergence occurs at 16–24°C. At 36° the percentage of infection is low and the growth of the lesions is comparatively slow. The temperatures favorable for the growth and sporulation of *H. oryzae* and for the growth of Philippine varieties of rice are nearly the same. At low temperatures both rice and its parasite grow slowly, but the latter relatively faster. Planting rice in soil or seed beds with temperatures of 32–36°C. materially reduces infection and blighting by this fungus, for at these higher temperatures infections are finally outgrown by the rice seedlings.—*E. W. Sinnott.*

3697. RAMSEY, H. J. Field Manager Ramsey on spraying for brown rot. *California Citrograph* 6: 104. 1921.—Orchard sanitation and thorough spraying with a 3–4–50 Bordeaux mixture will prevent trouble from this disease. Directions for preparing the mixture are given.—*C. S. Pomeroy.*

3698. RAMSEY, H. J. Need of care to prevent blue mold decay in transit. *California Citrograph* 6: 170–171. 1921.—Excessive decay in recent citrus shipments is correlated with an increase in defective picking operations which are known to cause such decay. Remedial measures are stressed.—*C. S. Pomeroy.*

3699. REED, GEORGE M. Physiologic races of oat smuts. *Amer. Jour. Bot.* 11: 483–492. Fig. 3. 1924.—Twenty-nine races of oats, belonging to 6 species, were inoculated with *Ustilago avenae* and with *U. levis*. Each species was obtained both from Missouri and from Wales. Not only were the various oat races found to differ markedly in their resistance to infection, but in many instances the spores from the 2 sources differed in their ability to produce infection on the same race of oats, thus indicating the existence of physiologic races among oat smuts.—*E. W. Sinnott.*

3700. REED, GEORGE M. Varietal susceptibility of wheat to *Tilletia laevis* Kühn. *Phytopathology* 14: 437–450. 1924.—All important varieties of winter wheat commonly grown in Missouri and a number of local selections were tested for their resistance to *Tilletia laevis* Kuhn. None of these have proved to have a very high degree of resistance. Sowings of artificially smutted seed were made at various dates during the falls of 1913–1916. There was a wide variation in the percentage of infection obtained with the same variety in different years and from different seedings during the same year. This variation could not always be correlated with either temperature or rainfall during the period of germination, but was probably due to the interaction of temperature and moisture on both host and parasite during this period. Results of a single experiment indicate that there is no tendency toward biological specialization of the parasite.—*B. B. Higgins.*

3701. REED, GEORGE M., AND JAMES A. FARIS. Influence of environal factors on the infection of sorghums and oats by smuts. I. Experiments with covered and loose kernel smuts of sorghum. *Amer. Jour. Bot.* 11: 518–534. Fig. 1–7. 1924.—In 7 susceptible varieties of sorghum the relation between soil temperature and moisture, on the one hand, and infection by *Sphacelotheca sorghi* and *S. cruenta* were studied. Relatively high percentages of infec-

tion were found over a wide range of soil temperatures but below 15° and above 30°C. there was a decrease, the degree of which was somewhat dependent on the variety. The highest infection also occurs in the low soil moistures and there is in general a progressive decrease in infection as soil moisture increases. Although infection occurs over a rather wide range of soil acidity, soils which were slightly acid were found to be most favorable for a high percentage of infection. The 2 smut species were very similar in their response to temperature, moisture and soil reaction. The resistant varieties maintained their resistance under all conditions studied.—*E. W. Sinnott.*

3702. SALMON, E. S., AND H. WORMALD. The prevention of "Bunt" in wheat. Jour. Ministry Agric. Great Britain 30: 918-925. 1924.—Tests are reported for the control of bunt in wheat, using a solution of 1 part of formalin in 480 parts of water at the rate of 2, 1½, 1 and ½ gallons, respectively, to the sack of 4 bushels of grain. Effective control was secured only where 2 gallons to the sack, were used.—Germination of the seed was not injured by any of the treatments.—*M. B. McKay.*

3703. SARTORY, A. Champignons parasites de l'homme et des animaux. [Fungi parasitic on man and animals.] Fasc. 8-11. P. 551-895. Pl. 45-50, fig. 67-91; Fasc. 12 (index) 47 p.; Fasc. 13 (supplement) 78 p. 2 pl., 11 fig. Lefrancois, Paris, 1922-1923.—Among the more important genera discussed in detail are *Aspergillus*, *Sterigmatocystis*, *Penicillium*, *Sporotrichum*, *Monilia*, *Oidium*, *Botrytis*, *Botryosporum*, *Chromostylium*, *Isaria*, and *Aschersonia*.—*Harry Braun.*

3704. SARTORY, A., AND R. SARTORY. Action du bichromate de potassium et du bichromate de cuivre sur la croissance du *Phytophthora infestans*. [The action of the dichromates of potassium and of copper upon the growth of *Phytophthora infestans*.] Compt. Rend. Acad. Sci. Paris 179: 69-70. 1924.—Ten cc. of oat agar were added to each culture tube. The tubes were then sterilized at 120°C. for 20 minutes. It was found that CuCr_2O_7 plays a more toxic role than $\text{K}_2\text{Cr}_2\text{O}_7$. The experiments performed in tubes give results similar to those done in petri dishes. It was found that CuCr_2O_7 retards the growth of *Phytophthora infestans* twice as much as $\text{K}_2\text{Cr}_2\text{O}_7$. It is thus a better antiseptic. The amount of antiseptic used was 0.05-2 gm. per l., 10 concentrations between these extremes being employed.—*C. H. Farr.*

3705. TOUMEY, J. W., AND T. T. LI. Nursery investigations with special reference to damping-off. Yale Univ. School Forest. Bull. 10. 1-36. 1924.—The effects of H_2SO_4 and of formalin were tested. The H_2SO_4 caused compacting of top soil, delayed germination, and decreased the amount of germination and the seasonal growth of both roots and tops, but checked weeds and effectively controlled damping off. Formalin lowered the amount of germination, stimulated growth, and failed to control weeds. The survival was highest at the end of the season when H_2SO_4 was used at the rate of 3/32 fluid ounce per square foot of seed bed.—*H. H. Chapman.*

3706. WARE, W. M. "Scorch" or *Gloeosporium* disease of red clover. Jour. Ministry Agric. Great Britain 30: 833-836. 3 fig. 1923.—The disease of red clover in England due to *Gloeosporium caulivorum* was first recorded near Cambridge in 1920. By the spring of 1923 many fields of red clover were reduced by this parasite to a very patchy condition. A description of the disease is given and it is stated that the most promising method of control consists in selecting resistant strains, some of which have been under observation.—*M. B. McKay.*

3707. WENIGER, WANDA. Ergot and its control. North Dakota Agric. Exp. Sta. Bull. 176. 1-23. 12 fig. 1924.—The various stages in the life history of *Claviceps purpurea* are described and illustrated, and the importance of the disease in North Dakota is emphasized. A list is given of 36 wild and cultivated grasses known to be infected in North Dakota. The literature on biologic races of *Claviceps purpurea* is summarized, as well as that on the conditions affecting development of the disease. The relation of moisture to the development of ergot during the month when sclerotia germinate and ascospores cause infection, is presented in graph form for an area in the state which had an epidemic on durum wheat in 1921, an average infection in 1920, and very little or below average infection in 1922 and 1923. Control measures are described, including crop rotation, resistant varieties, crop sanitation, and seed treatment with salt solution, followed by washing and the application of formaldehyde solution. A table shows the effect of salt solution, with or without washing to

remove traces of salt, of formaldehyde solution, and of a combined salt and formaldehyde solution on the germination of 3 kinds of wheat of different degrees of hardness.—*Author.*

DISEASES CAUSED BY BACTERIA

3703. CHASE, H. B. Crown gall on fruit trees in nursery and orchard. [In: *The crown gall resolution*. 41 p. (unnumbered).] 14 p. Amer. Assoc. Nurserymen: Louisiana, Missouri, 1924.—The effects of crown gall on fruit trees in different parts of the U. S. A. are discussed, and the differences of opinion as to injury and symptoms are emphasized. The suggestion is made that regulations and photographs be prepared as a step towards uniformity of inspection methods.—*Harry Braun.*

3709. COMMITTEE ON CROWN GALL INSPECTION. *The crown gall resolution*. 41 p. (unnumbered), 4 fig. Amer. Assoc. Nurserymen: Louisiana, Missouri, 1924.—This includes the questionnaires, papers and discussion as presented at the joint symposium of the American Phytopathological Society and the American Association of Economic Entomologists, in Cincinnati, Dec. 28, 1923–Jan. 1, 1924. The committee report as adopted states that the wide distribution of the disease and the difficulty of detecting it renders official inspection unwarranted; uniform inspection regulations are considered impractical, owing to local variations in amount of injury and in symptoms; "the only worth-while inspection is that made at the packing shed or at the point of destination;" the recommendation is made that active cooperation between the interested societies and associations should be arranged for a research program tending towards a better understanding of nursery inspection problems relating to crown gall. (See also this issue, Entries 3708, 3711, 3712, 3714).—*Harry Braun.*

3710. DAY, L. H. Experiments in control of cankers in pear blight. *Phytopathology* 14: 478–480. Fig. 1. 1924.—In order to arrest the spread of pear blight [*Bacillus amylovorus* (Burr.) Trev.] cankers on the trunks and large branches of pear trees, certain pear growers in California developed the practice of removing the outer layers of bark over the cankered area and then painting with a solution of the cyanide and bichloride of mercury (1 part of each, by weight, in 500 parts of water). At times this treatment gave good results but under certain conditions it failed completely. The bad results were apparently due to too rapid drying of the solution and consequent failure to penetrate the tissue. To remedy this fault the author tried dissolving the chemicals in a mixture of 1 part water and 3 parts glycerin. This solution has given uniformly good results.—*B. B. Higgins.*

3711. DIETZ, HARRY F. A nursery inspector's view of the crown gall problem. [In: *The crown gall resolution*. 41 p. (unnumbered).] 5 p. Amer. Assoc. Nurserymen: Louisiana, Missouri, 1924.—Regulations in different states are discussed. "The solution of the crown gall problem lies not so much in the unification of the state laws on the subject as on the exercising of better judgment on the part of those who are administering these particular laws and the manner in which these laws are administered. Here some definition of what constitutes an infection of crown gall serious enough to warrant rejection . . . is highly desirable as a guide to both nursery inspectors and nurserymen."—*Harry Braun.*

3712. DORSEY, M. J. Crown gall from the horticulturists' viewpoint. [In: *The crown gall resolution*. 41 p. (unnumbered).] 8 p. Amer. Assoc. Nurserymen: Louisiana, Missouri, 1924.—This paper discusses the horticultural plants which are worst affected by crown-gall, whether infected plants should be set out, and the effect on growth, yield and length of life after planting. Controlled experiments show a reduction in growth from crown-gall infection. Two lines of attack offer greatest promise. One consists in the selection of resistant varieties and in sanitary nursery methods; the other lies in further study of the organism with the hope of more efficient control measures being found.—*Harry Braun.*

3713. EASTHAM, J. W. Fire-blight. *British Columbia Dept. Agric. Circ. New Hort. Ser. 66*. 1–8. 2 fig. 1924.—This is a brief popular discussion of fire-blight as to history, cause, symptoms, varietal susceptibility and control measures.—*Harry Braun.*

3714. MELHUS, I. E. Some requisites of a better crown gall inspection. [In: *The crown gall resolution*. 41 p. (unnumbered).] 3 p. Amer. Assoc. Nurserymen: Louisiana, Missouri, 1924.—This includes a review of the answers made by plant pathologists to the committee's questionnaire (see this issue, Entry 3709). The diversified opinions expressed mean (1st)

that the inspection service is rightly conservative in not allowing crown gall infected nursery stock to pass; (2nd) that the problem needs intensive and extensive research. Exact definition of what type of infection, if any, may pass, is dependent on further studies of the biology of the organism and its reaction to environmental conditions. "By no amount of special pleading can it be made to appear that an infectious disease should be tolerated on nursery trees offered for sale simply because it is rather prevalent and is inconvenient to deal with.—It behooves those of us who are charged with research responsibilities to project a comprehensive research program which will lead to definite and concrete information regarding the various economic aspects of the disease. Such a program will need all the resources of the biological sciences."—*Harry Braun*.

3715. WINGARD, S. A. Bacterial soft-rot of tomato. *Phytopathology* 14: 451-459. *Fig. 1-3*. 1924.—A bacterial soft-rot of tomatoes, sometimes very destructive in Virginia, is caused by *Bacillus aroideae* Town. The disease is most destructive to green fruits. The organism is not capable of entering the unbroken cuticle of the fruits, but enters readily through small wounds such as needle punctures, and through cracks and sunscald spots. The optimum temperature for development of the rot is about 30°C. Spraying with soap-Bordeaux mixture appreciably reduced the amount of field infection.—*B. B. Higgins*.

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

3716. ANONYMOUS. Progress being made in control of scale by insect enemies. *California Citrograph* 6: 26, 39. 1920.—This is a review of reports showing the effectiveness of *Aphyus lounsburyi* in controlling black scale in citrus orchards in California. The Los Angeles county Horticultural Commissioner has estimated that \$850,000 was expended in that county alone last year in fumigation for black scale.—*C. S. Pomeroy*.

3717. ARMITAGE, H. M. Growing the new black scale parasite. *California Citrograph* 6: 143. 4 *fig.* 1921.—This is an account of the methods used by the California State Dept. of Agric. in rearing *Aphyus lounsburyi*, the newly introduced South African parasite of the citrus black scale. Sprouts developed on potatoes are inoculated with black scale. When the scales have reached the proper stage they are parasitized by the adult *Aphyus* which lays its eggs within the scales. Adults developing from these eggs are collected on a cloth-covered window and distributed to scale-infested orchards.—*C. S. Pomeroy*.

3718. BIJLLAARDT, A. C. VAN DEN. Een succesvolle bestrijding der witte luis. (*Oregma lanigera*). [A successful control of the white wooly aphid (*Oregma lanigera*).] *Arch. Suiker-indust. Nederland.-Indië* 32: 789-792. 2 *fig.* 1924.—White wooly aphids were very abundant on sugar-cane in 1923. Limewater did not check them. Cutting and burning of attacked leaves was found to be too severe a method. Petroleum emulsions and soap solutions were successful in killing the insects but burned the foliage. Weak solutions had the same effect.—Varieties E.K.28 and D.I.52 were more strongly attacked than others, showing local decreases in product up to 50% and more.—Advice is given to inspect plantations early and to spray with a mixture of 450 cc. of 10% tobacco extract (1 part tobacco and 9 parts water, boil $\frac{1}{2}$ hour and filter), 150 gm. of green soap (soft soap) dissolved in 150 cc. of alcohol, and 150 gm. of soda dissolved in 200 cc. of water. The solutions are mixed together, diluted to 15 l. and filtered through cloth. This spray was successful, killing the aphids but not yellowing the leaves.—*Peter J. Klaphaak*.

3719. QUAYLE, H. J., AND HUGH KNIGHT. The use of gas-tight fumigation covers. *California Citrograph* 6: 196, 228. 1 *fig.* 1921.—With gas tight covers better and more uniform results can be secured than with canvas tents and with the use of less gas on account of the prevention of leakage. The question of making a practical cover at a satisfactory price remains to be worked out by cooperative investigations with the manufacturers.—*C. S. Pomeroy*.

3720. ROUNDS, M. B. Wind as a factor in fumigation. *California Citrograph* 6: 124-125. 1921.—Results of fumigation work done under careful supervision showed less than $\frac{1}{2}$ as many living scale insects on trees fumigated when there was no wind, as were found following work done during light breezes.—*C. S. Pomeroy*.

3721. SMITH, HARRY S. Biological control of the black scale. *California Citrograph*

6: 108, 131. 1921.—This is a review of the studies with *Aphycus*, parasite of the intermediate stages of black scale, which has been of great practical value to citrus growers. In the more humid coastal sections where under "uneven hatch" conditions practically all stages of the scale may be found at any time, *Aphycus* breeds uninterruptedly and overcomes the scale. In the dryer interior sections the hatch of the scale is more even and during several months of each year there is no scale of the proper stage for *Aphycus* to breed upon; hence the parasite dies and must be reintroduced each season.—*C. S. Pomeroy*.

3722. WALTON, C. L. The control of aphides attacking sprouting potatoes. Jour. Ministry Agric. Great Britain 30: 829-833. 1923.—From a few tests on control of *Myzus persicae* on boxed, sprouting potatoes in which tetrachlorethane, paradichlorobenzene, and nicotine sulphate dust were used it is concluded that (1) all the substances used killed the aphids and (2) the 5% nicotine sulphate dust is preferred for conditions similar to those in the tests.—*M. B. McKay*.

3723. WOGLUM, R. S. Bettering the citrus pest control situation. California Citrograph 6: 150, 151, 180. 1 fig. 1921.—This is a report of studies carried on to make citrus pest control work more effective.—*C. S. Pomeroy*.

3724. WOGLUM, R. S. Red spider—daylight fumigation. California Citrograph 6: 118-119. 1 fig. 1921.—During the past season there has been considerable leaf-drop and fruit injury and loss from daylight fumigation of citrus trees that were weakened through severe infestation by red spider. Such orchards should not be fumigated in bright sunshine during the growing season.—*C. S. Pomeroy*.

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

3725. DECoux, L. La frisolée de la betterave sucrière. [The curling of the sugar beet.] La Sucrière Belge 44: 177-185. 3 fig. 1924.—The introduction points out that the agreements reached at the international phytopathological conference at Rome in 1914, including provisions for a unified service under the direction of a Central Plant Protection Office, were never ratified by the governments concerned. As a result, the efforts of each country were restricted to its own crops. Then, as an example of the danger from lack of proper precautions, the recent introduction of the potato beetle into Europe is cited. It is stated that before the war the curling ("la frisolée") of the potato was introduced into Europe. The symptoms of this disease are briefly described.—The author then lists the diseases of sugar beets which are known in Belgium and states that curling [curly-top] does not occur there. He advises precautions against its introduction. The symptoms of the disease are described and many of the phases of the knowledge of it as worked out by American investigators are detailed. The article ends with a discussion of the danger of introducing the disease into Belgium. In his opinion there are regions in that country favorable to the development of the disease. The possibility is suggested that the virus of potato curling may eventually evolve so that it can be transmitted to beets by the jassids which transmit it to potatoes. The greatest danger is the possible introduction of viruliferous leafhoppers from California. The article is illustrated with pictures reproduced from American publications. No bibliography or literature citations are given.—*Eubanks Carsner*.

3726. DIJT, M. D. Invloed van den rooitijd van aardappels op het optreden van degeneratie-ziekten in den nateelt. [Influence of potato harvest time on the occurrence of degeneration diseases in the progeny.] Landbouwk. Tijdschr. 36: 209-223. 1924.—The writer considers the differences in originally healthy races in relation to early and late harvesting, and the relation of infection of susceptible races to environment. Experiments were made with Eigenheimer, Blauwe Eigenheimer, Zeeuwsche Blauwen, Groene Bravo, Gele Bravo and Rooze Star. The conclusion is that early harvesting of seed potatoes should be practised only when the tubers are likely to become badly affected at a later stage.—*J. C. Th. Uphof*.

3727. Goss, R. W. Effect of environment on potato degeneration diseases. Nebraska Agric. Exp. Sta. Res. Bull. 26. 1-40. Fig. 1-3. 1924.—The author concludes that climatic conditions can be largely correlated in commercial potato fields with changes in appearance of the symptoms on the plants during the same season; changes in the amount of visible mosaic in the same region for different seasons; and changes in the amount of mosaic found in northern

grown seed from Nebraska when planted in the southern states. The effect of high temperature, intense sunlight, and low moisture in masking the symptoms of mosaic in western Nebraska is of as great importance as aphid transmission of the disease. In order to select healthy seed, to determine the percentage of mosaic, or to rogue properly, the conditions under which the plants are growing must be considered, and the work done at the most favorable time rather than at any fixed date. The symptoms of potato mosaic in the Bliss Triumph variety are influenced to a great degree by environmental conditions. Temperatures above 70°F. tend to decrease the number and severity of the symptoms, while temperatures below that point increase their visibility. Mottling was found to be the most constant symptom when temperature alone was varied, but high temperature with intense sunlight caused its disappearance. Wrinkling, curling, and rugosity were eliminated at the higher temperatures on plants with mild mosaic. High temperature is a greater factor in masking symptoms than low moisture or increased sunlight, although, under field conditions, all 3 usually occur together. The symptoms of mild mosaic reacted more quickly to environmental factors than the more severe types and the combinations of mosaic and spindle-tuber used in these experiments. The effect of environment on the symptoms decreased with the increasing age of the plant. Under field conditions mosaic was more severe with early plantings while spindle-tuber was more severe in late plantings. Short periods of 4-8 days of high temperature and increased sunlight were found sufficient to eliminate the leaf symptoms of mild mosaic and to decrease those of the more severe types.—*T. A. Kiesselbach.*

3728. MCCLINTOCK, J. A. Peanut mosaic: an investigation of plant disease. *Peanut Promoter* 11: 29. 1917.—A plant was found bearing a single shoot with mottled leaves. No infection was obtained on inoculation of healthy plants.—*Harry Braun.*

3729. ROSENFELD, ARTHUR H. The cause of mosaic disease of sugar cane. A step toward the solution of this mystery. *Internat. Sugar Jour.* 26: 535-536. 1924.—Evidence of a hopeful future for the discovery of the causal organism of mosaic disease is shown by the achievements of the German bacteriologists Frosch and Dahmen in visualizing, by means of the microphotographic apparatus designed by Kohler of Jena, the hitherto microscopic baffling bacillus causing the foot and mouth disease, also supposed to be caused by filtrable virus.—*Nellie E. Fealy.*

3730. SMITH, KENNETH M. On a curious effect of mosaic disease upon the cells of the potato leaf. *Ann. Bot.* 38: 385-388. 4 fig. 1924.—In the leaf cells of mosaic-infected potatoes, the author noticed a number of peculiar amoeba-like bodies, which in many cases were in close association with the cell nucleus. Owing to the resemblance of these bodies to a living organism, attempts were made to cultivate them, but without success; nor could they be shown to exhibit any movement or other sign of life. A careful examination of much material stained and fixed in various ways failed to reveal the existence of a nucleus in these bodies. Occasionally one or more small granules were discovered in them, but no definite statement can be made as to their nature.—*Margaret Newton.*

PARASITIC PHANEROGAMS

3731. COERT, J. H. *Aeginetia spec.*, een wortelparasiet op het suikerriet. [Aeginetia spec. a rootparasite on sugarcane.] Mededeel. Proefsta. Java-Suikerindust. Landl. Ser. 1924: 437-447. *Illus.* 1924.—This Aeginetia species belonging to the Orobanchaceae, is the only phanerogamic parasite found on sugarcane in Java. It differs from the well known *Aeginetia indica* L., in that it has flowers more elegant and less stiff, with a large yellow spot on the underlip and a faint light-rose color on the longer crownslips. It looks most like *Aeginetia pedunculata* (Roxb.) Walp. This parasite was first noticed in 1903, and was not observed again until 1924, when it was found in several plantations near together.—Germination of seed was unsuccessful.—The amount of damage caused is difficult to estimate and the manner of its spread unknown. The plants develop best in deeply shaded places.—A description is given with photographs and drawings.—The parasite has been found on the following canes: 90F, D.I.52, 2714 P.O.J., and E.K.28.—*Peter J. Klaphaak.*

3732. SAUNDERS, C. B. Dodder and its removal from clover seed. *Jour. Ministry Agric. Great Britain* 30: 928-931. 1924.—“Small-seeded dodder (*Cuscuta trifolii*) is probably on

the decrease in England owing to greater attention paid to cleaning. This seed can be easily removed from red clover by screening.—Large-seeded dodder (forms of *Cuscuta racemosa*) appears to be increasing, and may possibly be gradually acclimatizing itself. It cannot be easily removed from red clover by screening, but a new process of magnetic separation seems to offer very great promise of supplying a simple and economic means of overcoming this difficulty."—*M. B. McKay.*

NON-PARASITIC DISEASES

3733. ANONYMOUS. Orchard heating in the United States. [Rev. of: YOUNG, F. D., AND C. C. CATE. Damaging temperatures and orchard heating in the Rogue River Valley, Oregon. Monthly Weather Rev. 51: 617-639. Fig. 1-54. 1923.] Nature 114: 370. 1924.

3734. GRAEBNER, PAUL. Sorauer's Handbuch der Pflanzenkrankheiten. Die nicht-parasitären Krankheiten. [Sorauer's (P.) handbook of plant diseases. The non-parasitic diseases.] 5th ed. 997 p. 271 fig. Paul Parey: Berlin, 1924.—This comprehensive work discusses the following topics: The nature of plant disease; effect of geographical distribution on plant development; diseases caused by unfavorable environmental conditions (deficiency and excess of water and nutrient salts, lack of aeration); the relation to plant growth of humidity and air motion, temperature and light; wound injury and smoke injury.—*Harry Braun.*

3735. HEALD, F. D. Non-parasitic diseases of the apple in Washington. Proc. Washington State Hort. Assoc. 16: 146-158. 1920.—The distribution together with brief descriptions and in most instances control measures are given for the following troubles: alkali injury; bitter pit; brown bark spot; blister; cork; crown or collar rot; drought injury; fasciation; frost injury; hail injury; Jonathan freckle; Jonathan spot; oedema; rosette; rough bark disease; scald; internal breakdown; skin crack; spiralisms; spot necrosis or drought spot; spray injury; stigmonose; sun-scald; tan disease; water-core; and winter injury.—*Lillian C. Cash.*

3736. RAVAZ, M. L., ET M. G. VERGE. Le Rougeau. [Rougeot.] Ann. École Nation. Agric. Montpellier 18: 5-37. Pl. (col.) 1-2, fig. 1-11. No date.—This disease of the grape is of a physiological nature. Observations and pot experiments show that its occurrence is correlated with excessive moisture in heavy soils. Wounding, girdling or compressing the trunk are contributing factors. Thorough drainage and aeration of the soil is recommended. A detailed description and a history of the disease are given.—*F. F. Halma.*

3737. WILLIAMS, F. L. Segregating lemons affected with blossom end decline. California Citrograph 6: 126-127. 1 fig. 1921.—This is a discussion of practical methods of separating fruit affected with this baffling physiological trouble from sound fruit.—*C. S. Pomeroy.*

3738. YOUNG, FLOYD D. Smoke cover and direct radiation in frost protection. California Citrograph 6: 6, 40. 5 fig. 1920.—Observations during 2 nights in southern California, when the smoke was probably as heavy as will ever be experienced anywhere, showed a reduction in the rate of heat radiation of only about 10% during any considerable period. Additional observations at Medford, Oregon, under a dense blanket of smoke from open lard-pail heaters showed an average decrease in the rate of radiation of 9% due to the smoke. It appears that damage from even a moderately severe frost will not be prevented by a smoke cover alone.—Tests to determine the heat radiated by different styles of heaters showed the Scheu high stack to be most efficient in this respect. Burning at full rate, it radiated over twice as much as when burning at a low rate and 4 times as much as the open lard-pail heater.—*C. S. Pomeroy.*

DISEASES OF UNKNOWN CAUSE

3739. ANONYMOUS. A peculiar timber injury from a mysterious cause. Lumber World Rev. 46: 28. 1924.—A strip of timber $3\frac{1}{2}$ miles long and $\frac{1}{4}$ mile wide, running across Red Mountain in the Columbia National Forest, Washington, in a straight line and crossing contours varying more than 1000 feet in elevation, was injured by an unknown agency early in the growing season of 1923. Needles on the trees, which are chiefly Douglas fir, were killed

on parts of the trees varying from the top to the lower branches. The damage does not have the characteristics of ordinary winter injury. A severe thunderstorm in June of that year completely burned up a telephone line on Red Mountain for a distance of $\frac{1}{2}$ mile. This is the only clue available as to the cause of the injury which is being studied by the Wind River Forest Exp. Sta.—*C. E. Behre*.

3740. SKÅRMAN, J. A. O. Ett märkligt fall av abnormt utbildade *Salix*-hängen. [A remarkable case of abnormally developed catkins of *Salix*.] *Svensk Bot. Tidskr.* 18: 502-506. 3 fig. 1924.—A very peculiar teratological type of catkins of *Salix depressa* L. \times *repens* L. is described. The bracts were green and developed more or less as common leaves. Some of the flowers consisted of normal pistils but most of them were replaced by small, mostly vegetative buds. From some of these buds new shoots were developed the following year, part of these shoots being purely vegetative and part of them showing the same abnormality. The 3rd year most of the shoots were normal.—*O. Heilborn*.

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

3741. ANONYMOUS. Plant quarantines. *Nature* 114: 337-338. 1924.—This is a leading editorial commenting upon a discussion, on July 17, 1924, by British botanists and plant pathologists attending the Empire Mycological and Botanical Conferences. Quarantines are necessary to prevent introduction of plant and insect pests but often are a restriction upon trade. Common bases for international agreement are scanty at present and only 3 were formulated at the meeting: namely, (1) that every country should have the right to impose such restriction; (2) that no country has a right to ask another to accept its exports before it has established effective plant disease control within its own borders, nor (3) unless it maintains an efficient inspection service and proper arrangements for giving health certificates.—*O. A. Stevens*.

3742. BOVET, PEDRO A. Enfermedades más comunes de los frutales y manera de combatirlas. [Common diseases of fruit-trees and methods of control.] 3rd ed. 106 p. 79 fig. La Plata, 1921.—Various liquid and powdered insecticides and fungicides for fungous and insect diseases are discussed, the method of preparation being given in detail and the apparatus used in applying them described. The more common diseases are briefly described and illustrated.—*Lillian C. Cash*.

3743. DRESSSEL, AUGUST. Atlas der Krankheiten der landwirtschaftlichen Kulturpflanzen. [Atlas of the diseases of cultivated plants.] 46 p. 22 pl. Paul Parey: Berlin, 1924.—The common diseases of grain, clover, potatoes, beets, field-beans, beans, peas, cabbage, cucumbers and fruit are treated in 22 colored plates prepared from nature by the author. The text consists of brief descriptions by OTTO APPEL and E. RIEHM.—*Lillian C. Cash*.

3744. FAWCETT, H. S. The decay of citrus fruits on arrival and in storage at eastern markets. *California Citrograph* 10: 79, 98, 99, 103. 5 fig. 1925.—This is a fuller discussion of studies made during an eastern trip the past summer. [See also *California Citrograph* 10: 12, 22, 1924.] A detailed classification of lemon fruit-rots is presented including several spots and physiological troubles of unknown cause. Tables show the percentages of different decays found in various lots of fruit in the East. Alternaria or center rot was determined as causing over $\frac{1}{2}$ the decay that was found, the common blue and green molds were 2nd in importance, while the firm stem-end rot and anthracnose spot due to *Colletotrichum gloeosporioides* were 3rd in amount. The principal rots found in California oranges in August were those due to the common green mold and the blue contact mold.—*C. S. Pomeroy*.

3745. FLEMING, A. A comparison of the activities of antiseptics on bacteria and on leucocytes. *Proc. Roy. Soc. London B* 96: 171-180. Fig. 1. 1924.—Study of the action of a number of antiseptics shows a destructive action on leucocytes as well as on bacteria. Outside the zone of tissue where antiseptics effectually kill the bacteria is a region where the bactericidal action of leucocytes is seriously impaired. Evidence indicates that probably the most successful antiseptics are those whose period of effectiveness is briefest and whose impairment of leucocytes is therefore least serious.—*P. B. Sears*.

3746. FRON, G. Les maladies des plantes cultivées et leur traitement. [Diseases of cultivated plants and their treatment.] 22 col. pl., each accompanied by 3 or 4 unnumbered

pages of text. Jean Montaudon: Paris. [1923].—Common diseases of the following crops are discussed as to symptoms and control: cereals, vine and fruit trees, vegetables, forage plants and forest trees. The colored plates illustrate the symptoms, and also show microscopic details of the pathogens.—*Harry Braun.*

3747. LEE, H. ATHERTON. Present needs in cane disease control. *Internat. Sugar Jour.* 26: 543-544. 1924.—Mosaic disease was well known in Java as early as 1890 and has existed in the Philippines for years. It spread to Egypt and Argentine through cane cuttings imported from Java, and mosaic-infected cuttings from Argentina were introduced into Porto Rico, where the disease was first noticed in 1916, and into Cuba.—Fiji disease was known in the Fiji Islands, Australia, and New Guinea in 1910 and was found in the Philippines in 1916, and circumstantial evidence indicates that it was introduced into the Philippines on cane cuttings from Australia about 1912.—Downy mildew of cane was imported into Formosa and from Formosa into the Philippines.—Red stripe was introduced into Hawaii.—Gum disease was introduced into Porto Rico and wilt was introduced into the Philippines.—So far, mosaic is the only serious disease of cane in the Western Hemisphere, and now is the time to take steps to prevent the introduction of the Fiji disease, downy mildew, sereh, cane smut, wilt, gum disease, leaf scald, and other diseases and insect pests of cane.—The cane countries of the Western Hemisphere need a publicity campaign regarding cane diseases of the Orient. Importations of cane cuttings should be made only by competent cane men working in close contact with men familiar with cane diseases and cane insects. Selection of cuttings to be imported should be made by competent authorities and the imported cuttings should be grown in isolation under government supervision for at least one plant crop and one ratoon crop, and during the quarantine period inspections should be made several times each month by men working in close coöperation with cane entomologists and pathologists.—*Nellie E. Fealy.*

3748. OWENS, CHARLES E. Principles of plant pathology. viii + 414 p. (mimeographed). Edwards Brothers: Ann Arbor, Michigan, 1924.—This is a combined text and laboratory manual in 2 volumes. Part I contains 14 chapters which treat of the principles and generalities of the science of plant pathology. The topics discussed are the rise and development of plant pathology; modern plant pathology; definition, symptoms and classification of plant diseases; methods of investigating plant diseases; relation of plant diseases to environment; plant disease control; fungicides; disease-free seed and nursery stock; quarantine and inspection; sick soil; resistance and immunity; relation of insects to plant diseases; storage and transportation problems; and unsolved problems of plant pathology.—Part II contains 12 chapters and consists of a series of exercises covering representative types of plant diseases. The diseases listed for study are classified as follows: (1) Parasitic diseases caused by slime molds, bacteria, fungi, parasitic seed plants and parasitic animals; (2) virus diseases; (3) non-parasitic diseases; and (4) diseases of unknown origin. Under each disease listed for study, the discussion falls into 3 divisions: (a) Laboratory directions, (b) a text discussion of the disease, and (c) a list of references.—*Author.*

3749. PELTIER, G. L., AND GOSS, R. W. Control equipment for the study of the relation of environment to disease. *Nebraska Agric. Exp. Sta. Res. Bull.* 28. 1-16. Pl. 1-3, fig. 1-4. 1924.—The authors illustrate and describe apparatus used at the Nebraska Exp. Sta. for controlling atmospheric and soil conditions in their investigation of plant diseases.—*T. A. Kieselbach.*

3750. TAUBENHAUS, J. J., AND F. W. MALLY. The culture and diseases of the onion. xv + 246 p. 13 fig. E. P. Dutton & Co.: New York, 1924.—The following diseases are discussed as to symptoms and control: Non-parasitic; soft rot (*Bacillus carotovorus*); downy mildew (*Peronospora schleideniana*); smudge (*Volutella circinans*); smut (*Urocystis cepulae*); rust (*Puccinia porri*); neck rot (*Botrytis allii*); pink root (*Fusarium malli*); storage rots, and various diseases of animal and insect origin.—*Harry Braun.*

3751. TEHON, L. R. A preliminary report on the occurrence and distribution of the common bacterial and fungous diseases of crop plants in Illinois. *Illinois Dept. Registr. & Educ. Bull.* (Div. Nat. Hist. Survey) 15: i-viii + 175-325. 125 maps. 1924.—Following the collection, classification and studies of the structure and life histories of the bacteria and fungi

causing diseases of crop plants, the next important step is concerned with epidemiology. "A necessary preliminary step is the accumulation of a complete catalog of the kinds of diseases present, and of accurate information concerning their distribution and severity. . . . The reader will find that the diseases discussed in this preliminary report are grouped according to the crops which are subject to them. Because of the great importance of the cereal crops their diseases are discussed first. Following them are the diseases of forage crops; the diseases of fruits, including small fruits; the diseases of vegetable and field crops; and the important diseases of a few commonly grown ornamental plants. The plan of the discussion has been to give in each case a brief description of the disease, a short summary of its history in Illinois, a statement of its distribution as now known, some indication of the crop losses for which it is held responsible, and, finally, a brief statement of the usual methods of control.—*Frederick V. Rand.*

3752. WALKER, CRANSTON. Germ-theories of transferable diseases from the seventeenth century to the time of Pasteur. *Sci. Prog.* 19: 443-451. 1925.—A historic account of the discovery of microorganisms and their connection with disease is given, after which the author suggests tentative reasons why the germ-theories were discussed and rejected at intervals for 2 centuries before they were generally accepted.—*L. A. Kenoyer.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*

E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 3151, 3154, 3163, 3227, 3230, 3265, 3382, 3384, 3478, 3489, 3490, 3494, 3502, 3532, 3533, 3542, 3543, 3549, 3995, 4000)

3753. ANONYMOUS. Cultivation of the kola nut. *Pharm. Jour.* 112: 555. 1924.—The kola nut, *Cola acuminata*, indigenous to French West Africa, is now largely cultivated in Brazil and the West Indies. The total annual production now approximates 20,000 tons, about 25% of which are produced in French Africa. The varieties best known are *Cola rubia*, *C. alba*, and *C. pallida* (so called on account of the varying color of the nuts), but a variety, *C. mixta* is now extensively grown in the plantations. The methods of preparing and preserving the nuts are carried out with great care, and the drug is one of the cleanest in commerce.—*E. N. Gathercoal.*

3754. ANONYMOUS. The cascara industry of British Columbia. *Pharm. Jour.* 112: 530-531. 1924.—With the continually increasing worldwide use of cascara, the bark of *Rhamnus purshiana*, British Columbia has awakened to the value of one more of nature's gifts. Trainloads of bark are being sent from this province to the manufacturing firms, and the government as well as the Vancouver Board of Trade are taking measures to protect the trees so that they may not suffer the fate of those in the nearby territory of the U. S. A. The cascara industry is a relatively new one in British territory but the cascara plants must be protected and cultivated or the industry will wane here as it has in the U. S. A. Through information in pamphlet form and by lecture, the attention of loggers, settlers and land owners in the cascara districts has been called to the great economic importance of this drug. As much as 200 pounds of bark has been collected from a single tree. Experimental work in cultivation has been carried out by the Dominion Department of Agriculture since 1914 and it has been demonstrated that by setting the trees 2 feet apart in rows 3 feet apart and by thinning the trees as needed after a few years that a profitable yield of bark can be had in 8-10 years. In view of the very recent announcement that valuable extract can be prepared from small twigs and trimmings, it may be that such plantations could be made profitable almost from the beginning.—*E. N. Gathercoal.*

3755. ANONYMOUS. [Rev. of: HENRY, T. A. *The plant alkaloids*. 2nd ed. viii + 456 p. 8 pl. J. & A. Churchill: London, 1924.] *Nature* 114: 378. 1924.

3756. ANONYMOUS. [Rev. of: UNDERHILL, FRANK P. *Toxicology*. P. Blackiston's Son & Co.: Philadelphia, 1924.] *U. S. Naval Med. Bull.* 21: 868. 1924.—"In it are a discussion of

the principles of toxicology and short, concise descriptions of the effects of various poisons on the organism, The volume is of use as a handy reference of the essentials of the science of poisons."—*Frederick V. Rand.*

3757. BULLOCK, KENNETH. The assay of valerian root and of certain other aromatic drugs. *Pharm. Jour.* 113: 109-113. 1924.—The usual method for estimating the volatile oil in valerian root is generally by steam distillation but the objections to this method of assay are: (1) that the oil distils over very slowly so that the end of the process is indefinite; (2) that such a large volume of aqueous distillate is obtained containing a comparatively small quantity of essential oil; and (3) that the oil suffers much decomposition during the distillation process. To overcome these objections, extraction with volatile solvents was tried and it was found that petroleum benzin with a boiling point below 45°C. possessed definite advantages over other solvents employed. Furthermore, moistening the drug with an equal quantity of water before extracting with the benzin, tended to increase the yield of oleoresin. It was proved, however, that the water did not bring about an enzymatic reaction but apparently acted only in a mechanical way to swell the cells. The addition of acid or alkali to the water rather tended to decrease the yield of oleoresin. By grinding the moistened drug with sand before extraction, the time in the Soxhlet could be reduced to 4 hours. There was no advantage in macerating the drug for an extended period of time. The drug should be in a relatively fine powder, at least No. 40. Too much water should not be added to the drug. The method of assay is given in detail; and also a method for separating the volatile oil from the resin by vacuum distillation with an excess of glycerin. It was found, too, that other volatile oil drugs could be successfully extracted by this method, notably cinnamon and ginger. Experiments upon fresh drugs indicate that the amount of moisture present in an aromatic drug which is being extracted by a volatile organic solvent has a great influence on the yield of oil.—*E. N. Gathercoal.*

3758. CHADWICK, DAVID PRAIN. Economic and hygienic relationships of cinchona bark and its alkaloids. *Pharm. Jour.* 112: 642. 1924.—Cinchona bark was first exploited as a forest product in the Loxa district of Southern Ecuador. The effects of exploitation without regeneration led to competition between the pale or crown bark of *C. officinalis* from Loxa with the red bark of *C. succirubra* from Chimborazo, and to the replacement of the former by the latter, which is still the only cinchona bark recognized in the British Pharmacopoeia. However, red bark in turn had to compete in trade with the grey bark of *C. micrantha* from Huancu; grey, to compete with and be replaced by the yellow bark of *C. calisaya* from Bolivia; and yellow, to be replaced by the Colombian bark of *C. lancifolia*. Colombian was the last wild cinchona worth exploiting; before supplies were exhausted Europe began to cultivate cinchona. The turning of a forest product into a crop is subject to limiting factors. That of labor supply involved the transfer of cinchona to the old world; that of environment limited early operations to south-eastern Asia; that of adaptability excluded yellow bark from South India and Ceylon; that of alkaloid-content involved selection of strains within particular kinds; that of alkaloid-character involved selection of kinds. Many other economic phases in relationship to medicinal uses and values are discussed.—*E. N. Gathercoal.*

3759. CRUESS, W. V. The preparation and refining of olive oil in southern Europe. *California Agric. Exp. Sta. Circ.* 279. 1-43. 1924.—The Zorzalena variety is the most important oil olive grown in southern Spain; the Arbequina, in northern Spain. In France the Picholine and Verdal are planted both for pickling and for oil. Numerous varieties are used in Italy. Olives are stored in shallow piles and frequently stirred to minimize decomposition before pressing which is completed within 24 hours. The olive fly is a serious pest in Spain and Italy. Of the crushing and pressing methods, 2 methods differing from the California process have made considerable progress: (1) "Acafulco" consists in separating the oil from the pulp and water by rubbing the finely ground pulp against a very fine nickel screen; (2) "Colin" is a continuous press. Centrifugal separation of oil and "black liquor" is coming into general use as a substitute for settling and decantation or skimming. Oil is not washed at all, the bitterness being removed by long storage, settling and racking. Filters are usually of the filter-press type; funnel and filter paper is condemned. Refining of oil usually consists in neutralizing free acid by NaOH, removing excess of color with fuller's earth or decolorizing

carbon, and deodorizing by treatment with superheated steam in vacuo. Pomace is treated with carbon bisulphide or trichlorethylene to recover residual oil.—*A. R. C. Haas.*

3760. DEANE, HAROLD, AND W. E. EDMONTON. The estimation of nux vomica preparations. *Pharm. Jour.* 113: 96-97. 1924.—To avoid the very persistent emulsion formed in the usual method of separating the strychnine from preparations of nux vomica, benzol (B. P. 1898) is used in place of the chloroform and the aqueous liquid is more highly diluted with water. The benzol is not quite so good a solvent for strychnine as the chloroform but sufficient benzol is used to insure the extraction of all of the strychnine that might be present. The use of sodium hydroxide has no advantage over sodium carbonate if the benzol is used as an extractive, though it is just as good. The improved process is given in detail along with a table showing the slightly higher yields of strychnine by this method.—*E. N. Gathercoal.*

3761. DORT, D. B. Assay of extract of nux vomica. *Pharm. Jour.* 113: 251-252. 1924.—Further experiments with the use of Na_2CO_3 and NaOH in the assay of nux vomica preparations, indicate that even with the use of petroleum benzin as the solvent, the NaOH is to be preferred to the Na_2CO_3 .—*E. N. Gathercoal.*

3762. DORT, D. B. Assay of opium. *Pharm. Jour.* 112: 416-417. 1924.—Opium that has been extracted with dilute alcohol yields distinctly more concordant results when assayed by the lime method than when the powdered drug is extracted directly by treatment with water and lime. A standard method of preparing the extract with dilute alcohol is offered and results of assays are presented.—*E. N. Gathercoal.*

3763. EVERS, NORMAN, AND THOMAS McLACHLAN. Tragacanth and its mucilage. *Pharm. Jour.* 113: 94-96. 4 fig. 1924.—To determine the viscosity of Tragacanth mucilage various methods were tried including "the falling shot method" and "the bismuth carbonate suspension method." Also, determinations were made as to the nitrogen content in relation to jelly strength, ash in relation to jelly strength and the effect of grinding the tragacanth upon the mucilaginous powers. It was found that: (1) the strength of tragacanth mucilage does not vary with the nitrogen content or ash content of the gum; (2) tragacanth does not contain ethereal calcium sulphates in appreciable quantity; (3) heating the dry gum to temperatures of 100-120°C. seriously impairs the suspending power; (4) the effect of fine grinding of the gum is seriously to diminish the strength of the mucilage on account of the heating of the gum; (5) heating the mucilage gives a uniform product much more rapidly than in the cold, and a maximum suspending power is reached after about 1 hour in the steam-oven, after which it diminishes; (6) for the routine testing of tragacanth the bismuth carbonate suspension method described is recommended, the gum being in "No. 30-60 powder."—*E. N. Gathercoal.*

3764. GARNER, W. B. A note on Australian peppermint oil. *Pharm. Jour.* 113: 3. 1924.—The oil was distilled from a cutting of peppermint of the 2nd year's growth, in March 1924, when the plant was just commencing to flower. The mint originally imported from Mitcham, Great Britain, was first grown in the government nursery at Hamel, Western Australia, and later in fields, the soil as near as possible like the original soil from which the plants were taken. There seemed to be no damage from diseases nor from slugs or other plant pests. The herb was dried for 24 hours before distillation. In physical properties the oil corresponds favorably with the best American oil and contains 54.74% of total menthol. A complete statement of physical properties is appended.—*E. N. Gathercoal.*

3765. GREENISH, HENRY G. Crude drugs in the British Empire Exhibition. *Pharm. Jour.* 113: 353-354, 375-380, 404-405. 1924.—This survey of the crude drugs shown in the exhibition is arranged according to the country of production and includes mention of a very large number of plants yielding crude drugs in the various parts of the British Empire. Those of especial interest are as follows: Great Britain—English-grown aconite root, henbane, foxglove, chamomile flowers, belladonna, dandelion, colchicum, hydrastis and squirting cucumber. India—*Abroma augusta* L., a valuable diuretic, urinary antiseptic, and emmenagogue; *Holarrhena antidysenterica* Wall, with an anthelmintic, astringent bark; *Boerhaavia diffusa* L., a valuable diuretic containing the alkaloid, punanarvine; as well as an extended list of other well known Indian drugs. Exhibits from Burma, British Malaya, Sarawak, Ceylon, Hong Kong, West Indies, British Guiana, East Africa, and West Indies are also mentioned.—*E. N. Gathercoal.*

3766. GRIEBEL, C. *Ergebnisse der Untersuchung von Heilmitteln und Geheimmitteln, Kosmetischen und ähnlichen Mitteln* (10 Fortsetzung). [Results of investigation of medicinals, proprietaries, cosmetics, etc. (10th report).] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 45: 240-246. 1923.—The author gives brief reports of microscopic and chemical investigations on 64 samples, mostly of German proprietaries intended for female and venereal diseases.—*E. E. Stanford.*

3767. HENRY, AUGUSTINE. *Larch agaric*. *Pharm. Jour.* 112: 439-440. 1924.—This powerful drug has been known from earliest times, being fully described by Dioscorides, who says that it was imported from Agaria, in southern Russia, and from Galatia and Cilicia. It preserved its reputation during the middle ages and is still official in the Pharmacopoeias of Austria, Germany, Switzerland, and France. The drug consists of the sclerotial form of the fungus, *Fomes officinalis* Faull. It sometimes reaches a size of 15 pounds in weight. It is at present largely exported from the vicinity of Archangel but to some extent also from Trieste. It is gathered, also, in the southern Tyrol. The host plant in Asia Minor is the Labanon cedar; in northern Russia, mostly *Larix sibirica*; and in the Alps, *Larix europaea*. The fruiting body of the fungus contains an extremely large content of resin (50-70%) which is aperient and cathartic.—*E. N. Gathercoal.*

3768. HESS, ALFRED F., MILDRED WEINSTOCK, AND DOROTHY HELMAN. *Oil activated by irradiation. II. Separation into an antirachitic and an inactive fraction*. *Proc. Soc. Exp. Biol. & Med.* 22: 76-77. 1924.—By radiating vegetable oils such as linseed or cotton seed, a substance is produced similar in its antirachitic properties to that in cod liver oil.—*M. M. Brooks.*

3769. HOARE, A. H. *Peppermint: its cultivation and distillation*. *Jour. Ministry Agric. Great Britain* 30: 751-756. 1923.

3770. HOBART, F. G. *Copper in nux vomica*. *Pharm. Jour.* 112: 670. 1924.—The B. P. Codex and other standard textbooks of Materia Medica are unanimous in stating the nux vomica seed invariably contain traces of copper. The presence of this element is usually advanced as the explanation of the greenish-blue color which may develop in mixtures containing tincture of nux vomica and an ammoniacal solution. A solution containing 1-10,000 of copper sulphate is about the weakest dilution which will give a discernible coloration with ammonia. Hence, in a mixture containing nux vomica in an average dose, at least 2% of copper must be present in the nux vomica to show the characteristic coloration with ammonia. Such an amount of copper in nux vomica seed is highly improbable and a careful testing for copper in many different samples indicates that in no case was the slightest reaction indicative of the presence of copper, obtained. However, caffeotannic acid in aqueous solution does give a greenish-blue color with ammonia. This tannin is present in nux vomica and in coffee seed which also give the same color reaction with ammonia. It seems probable that copper is never present within nux vomica seed.—*E. N. Gathercoal.*

3771. HOLMES, E. M. *Henna*. *Pharm. Jour.* 112: 437-439. 1924.—Because of the very extensive employment of this leaf drug throughout the civilized world for the coloring of the hair as well as of the nails and teeth, a resume of the literature is presented. The article deals with the history, name, botany, cultivation, chemistry, uses, and economics of henna. Henna has been used from the most ancient times by the Egyptians and Jews. It was known to Pliny in the first century A.D. and has been used by the Arabians since his time. It is extensively cultivated today in Egypt and Tripoli and is generally ascribed to *Lawsonia inermis* while *L. spinosa* is regarded as only a variety. In addition to the use of leaves for giving a red-brown color to the hair, they are quite extensively used by the Mohammedans as a medicine. The bark of the plant is used in jaundice, diseases of the spleen and obstinate skin diseases; an infusion of the flowers is said to cure headache and the fruit has been used as an emmenagogue.—*E. N. Gathercoal.*

3772. JACOBS, W. A., AND A. M. COLLINS. *Strophanthin. V. The isomerization and oxidation of isostrophanthidin*. *Jour. Biol. Chem.* 61: 387-403. 1924.

3773. JORDAN, C. J., AND A. H. WARE. *The identification and classification by chemical methods, of drugs containing tannin: 1.—Application of the "goldbeater's skin test."* *Pharm. Jour.* 113: 102-105. 1924.—The use of the "goldbeater's skin test for tannin" is reviewed.

The author holds that this test affords a more valuable method than any qualitative test hitherto devised, with a fair degree of certainty of determining whether a body is a real tanning material. In addition to the test for tanning-effects, the staining-effects of some drugs are valuable indications of the presence of certain natural vegetable dyes, generally belonging to the anthraquinone or anthoxanthin classes. In practically all cases of "tanning" effect can be readily distinguished from any "dyeing" effect. The use of the iron solution has but slight effect upon the stains if they are "dyes" but a very marked effect if the stains are true tannins. Seventy-three drugs have been examined and all of those in which true tannin has been definitely found respond readily to the test, but many which have been reputed to contain tannin were found to be devoid of any true tanning powers. It is especially worthy of note that the usual anthraquinone drugs, such as Aloes, Senna, Cascara, Chrysarobin; the flavone drugs, such as Belladonna, Hyoscyamus, and Stramonium; as well as Digitalis, Buchu, Jaborandi, Broom Top, Lobelia, Podophyllum, Ipecac Root, Serpentaria, Valerian, Berberis, Calumba, Ignatia, and Nux Vomica Beans are quite devoid of any tannin. Furthermore, the careful application of the "Extended Stiasny's Test," and the "Iodine-Ammonia Test," with respect to the substances examined by the "Goldbeater's skin test" indicates a substantial agreement between the 3 methods. Extended lists and a classification of drugs and tannin-bearing substances are appended.—*E. N. Gathercoal.*

3774. LAING, J. W. **Plant products.** Pharm. Jour. 112: 666-668. 1924.—The author discusses the production by the plant of sugar, tannins, gums, glucosides, alkaloids, fats and oils.—*E. N. Gathercoal.*

3775. LANGLAIS, P., AND J. GORY. **Contribution à l'étude de l'essence concrète d'iris.** [A study of the concrete essence of iris.] Compt. Rend. Acad. Sci. Paris 179: 173-175. 1924. Six saturated fatty acids are found in the concrete essence of iris: caprylic, pelarginic, capric, undecylic, lauric, and tridecyllic. The 3 acids with the odd number of carbon atoms, C₉, C₁₁, and C₁₃, have not previously been reported as occurring in the essential oils.—*C. H. Farr.*

3776. MAPLETHORPE, CYRIL W. **Note on artemisia gallica, Willd.** Pharm. Jour. 113: 106. 1924.—In view of the conflicting statements in the literature regarding the presence of santonin in *Artemisia gallica*, the author made an examination of material personally collected. It was found that 6 pounds, 6 ounces of fresh herb yielded 2 pounds, 5 ounces of dried material and 1 pound, 7 ounces of leaves and flowers. The moisture in the powdered substance ran 9.60% and the ash 13.65%. It was not possible by any method to obtain any indication of santonin present in the plant.—*E. N. Gathercoal.*

3777. MELLOR, ERNEST M. **The countries our drugs come from. Venezuela.** Pharm. Jour. 112: 660-662. Figs: 1-8. 1924.—The Guayana highlands bear 2 important fruit trees, namely, Brazil-nut and tonka-bean, the products of which enter into world wide commerce. Rubber produced from wild *Hevea*, balata gum from *Mimosa globosa*, and cacao seed from *Theobroma cacao* are important articles of export. Copaiba from *Copaifera Langsdorffii*, angostura bark from *Galipea officinalis*, and simaruba from *Simaruba officinalis* are 3 well known drug exports, while from the neighborhood of Maracaibo, guaiacum wood from *Guaiacum officinale* is exported and in the 3 islands of Curacao, Aruba, and Bonaire large quantities of aloe are produced.—*E. N. Gathercoal.*

3778. MELLOR, ERNEST M. **The countries our drugs come from. Colombia.** Pharm. Jour. 113: 218-222. 1924.—The author briefly discusses the production of vanilla, balsam of tolu, balsam of copaiba, ipecac root, vegetable ivory, cinchona, winter's bark, castor oil seed, and tonka beans in Colombia.—*E. N. Gathercoal.*

3779. MELLOR, ERNEST M. **The countries our drugs come from. Peru.** Pharm. Jour. 113: 555-557. 1924.—At one time Peru was noted for its cinchona and quinine production, but this industry is now dwarfed by the production of cacao beans, coca leaves, rhatany root, and vegetable ivory.—*E. N. Gathercoal.*

3780. MORGAN, G. T., AND E. HOLMES. **Note on the ketonic constituent of a sample of algerian oil of rue.** Pharm. Jour. 112: 640. 1924.—The investigation of Algerian oil of Rue indicated a considerable variation in the properties and composition of various lots of this oil and wide discrepancies in the published analyses of the oil are probably due to the following factors: (1) The use in certain investigations, of oil the origin of which was doubtful; (2) dis

regard of the fact that 2 varieties of *Ruta* exist in Algeria, namely, *R. montana* which yields a winter oil containing 90% of methyl *n*-nonyl ketone, and *R. bracteosa* which yields a summer oil containing chiefly methyl *n*-heptyl ketone; and (3) variations due to seasonal changes, climate and cultivation and subsequent treatment of the soil.—*E. N. Gathercoal*.

3781. MORTON, JAMES K., AND G. C. SPENCER. The sulfuric index of cottonseed oil and in admixtures with olive oil. *Jour. Oil and Fat Indust.* 1: 66-71. *Fig. 1.* 1924.

3782. SEDDON, H. R. Alleged blindness in horses from *Cucumis myriocarpus*. *Agric. Gaz. New South Wales* 35: 832. 1924.—Experimental feeding trials have not indicated that this plant will cause blindness in horses.—*L. R. Waldron*.

3783. SHORT, G. R. A. The assay of *Strychnos cinnamomifolia*, and a note on the determination of strychnine. *Pharm. Jour.* 113: 97-98. 1924.—The seed of *Strychnos cinnamomifolia* closely resemble those of *Strychnos nux vomica* and contain a fair percentage of alkaloid though they have not been commercially exploited. The plant grows in Ceylon and adjacent parts of India. The result of the investigation may be stated as follows: moisture, 11.93%, ash, 1.42%, total alkaloids, 2.573%, brucine, 2.231%, and strychnine, 0.342%. Notes on the assay methods indicate that the yield of total alkaloid determined gravimetrically was about 10% higher than if determined volumetrically and the treatment with nitric acid to destroy the brucine gave better results at a temperature of 20 than at 50°C.—*E. N. Gathercoal*.

3784. WALLIS, T. E., AND ALISON M. SAUNDERS. The rhizomes of *helleborus niger* and *helleborus viridis*: a comparative study. *Pharm. Jour.* 113: 90-94. *Fig. 7.* 1924.—An extended study of the rhizomes and roots of these very closely related species of *Helleborus* by the authors shows: (1) that the currently accepted criteria by which the rhizome and roots of *Helleborus niger* are considered to be distinguishable from *H. viridis*, are unreliable for that purpose; (2) that no characters exist which are constant for each of these species and which could be used as a certain means of differentiation. (The opinion of Fluckiger and Hanbury that there are no striking characters by which these 2 drugs can be discriminated has, therefore, been confirmed); (3) that so far as can be ascertained at present, the only certain method of distinguishing the one rhizome from the other is the method advocated by Hartwich who suggests the collection of the rhizomes with the radical leaves attached, these leaves being characteristic.—*E. N. Gathercoal*.

3785. WARE, ALAN H. Plant colouring-matters and chromogens in relation to pharmacognosy. *Pharm. Jour.* 113: 252-253, 530-532. 1924.—The author states that most plant coloring-matters are of little importance commercially, the majority of them having been replaced in commercial processes by synthetic dyes giving similar or superior results. Among the plant dyes known to the pharmacist which are still in use are: annatto, logwood, catechu, alkanet, turmeric, lac-dye, and saffron. Among the nations of the less civilized countries, however, a great many plant dyes are still extensively used. Pharmacists are interested, however, in the characteristic reactions of many plant chromogens in connection with the identification and purity of drugs. The great majority of plant coloring-matters fall into the following groups: (1) Non-benzenoid coloring-matters which are insoluble in the cell-sap, are not derived from soluble chromogens, and are usually in association with plastids; (2) benzenoid chromogens, usually complex phenols or phenol-carboxylic, soluble in cell-sap, are derived from soluble chromogens frequently existing as glucosides and usually are not associated with plastids; (3) a small group of colored alkaloids and their salts.—In group (1) occur the chlorophylls, carotinoids (carotin and xanthophyll, etc.). In group (2) are the anthraquinones, anthranols, the anthoxanthins, and the tannins. Extended discussion of the chemical properties, the tests for, and the identification values of each of these groups is included.—*E. N. Gathercoal*.

3786. X., PARIS. Un remede actif contre la lepre. [An active remedy for leprosy.] *Nat. Canadien* 50: 196-197. 1924.—The author cites the work of Rogers of English India and Hollman of America, in Hawaii, who use *Chaulmoogra* oil for the cure of leprosy; and the collection by an agent of the United States Government in 1920 of seed of *Hydnocarpus anthelmithicus*, in Siam, of *H. Catanca* and *Taraktogenos Kurzii*, in Burma, and of *H. Hutchinsonii* in the Philippines, from seed of which, the oil may be obtained. Their successful reproduction in plantations in the Hawaiian Islands are also noted.—*A. H. MacKay*.

PHYSIOLOGY

B. M. DUGGAR, *Editor*W. J. ROBBINS, *Assistant Editor*

(See also in this issue Entries 3143, 3151, 3163, 3184, 3213, 3216, 3217, 3218, 3264, 3277, 3278, 3562, 3563, 3570, 3594, 3621, 3645, 3687, 3696, 3756, 3768, 3770, 3775)

GENERAL

3787. BOGUE, HERMAN ROBERT (Editor). *The theory and application of colloidal behavior* (in 2 volumes). 829 + xx p. *Illus.* McGraw-Hill Book Co.: New York, 1924.—This work is published in the group "International Chemical Series" (H. P. TALBOT, Consulting Editor). The 1st volume is devoted to heterogeneous equilibria, embracing among the divisions of more direct biological application a chapter by JACQUES LOEB on the crystalloidal and colloidal behavior of proteins, and one by DONALD D. VAN SLYKE on the colloidal behavior of the body fluids; surface kinetics; adsorption and catalysis, including a chapter on enzymes by E. FRANKLAND ARMSTRONG; structure, in which a chapter by JAMES W. MCBAIN is devoted to the study of soap solutions and its bearing upon colloid chemistry. The 2nd volume is devoted to mineral products, under which MILTON WHITNEY discusses the colloid chemistry of the soil; vegetable products, with chapters by CARL L. ALSBERG, LESTER W. TAFF, GUSTAVUS J. ESSELEN, JR., G. STANFORD WHITBY, and E. V. MCCOLLUM; and animal products, including a treatment of gelatin and glue by ROBERT H. BOGUE.—*B. M. Duggar.*

3788. TAYLOR, HUGH S. (Editor). *A treatise on physical chemistry* (in 2 volumes). 1352 + 41 p. *Illus.* Van Nostrand Co.: New York, 1924.—These volumes represent a cooperative treatment of the whole modern field of physical chemistry. They represent a fundamental presentation, and for students in physiology could serve not as a discussion of the applications of this science in biology, but as a compendious background of theoretical information.—*B. M. Duggar.*

3789. TRIER, GEORG. *Chemie der Pflanzenstoffe*. [Chemistry of plant products.] viii + 605 p. Gebrüder Borntraeger: Berlin, 1924.—In brief, this book is an elaborate presentation of the chemistry of the organic compounds found in plants. There is an extended introduction of 57 pages including an historical survey and a general discussion of the products. The further work is divided into 3 major parts, treating respectively the simpler compounds, the more complex, and the compounds of complex and unknown structure. In the 1st part, accordingly, are included the aliphatic and the cyclic compounds, together with certain other simpler compounds of undetermined chemical composition. Under the more complex are discussed the glucosidal; the ester-like; and compounds such as cerebrosides, simple proteins, and conjugate proteins. Among those products treated in the 3rd category are antigens, toxins, vitamins and enzymes.—*B. M. Duggar.*

DIFFUSION, PERMEABILITY PHYSICO-CHEMICAL RELATIONS

3790. ALSBERG, C. L., AND E. E. PERRY. *The effect of grinding upon starch and starch pastes*. *Proc. Soc. Exp. Biol. and Med.* 22: 60-61. 1924.—Grinding starch in a pebble mill renders about 60% of the starch soluble in cold water. Mechanical action breaks the membrane surrounding the granules, so that the contents may be leached out with the greatest ease.—*M. M. Brooks.*

3791. HEIM, F., AND R. AUDUBERT. *Pouvoir agglutinant et pouvoir coagulant des agents de coagulation vis-à-vis des latex caoutchoucifères*. [Agglutinating and coagulating power of agents of coagulation in the presence of rubber-bearing latex.] *Compt. Rend. Acad. Sci. Paris* 179: 209-210. 1924.—The agglutinating ability of a substance is indicated by the inverse of the amount capable of producing the 1st flocculation. The coagulating ability of a substance is the inverse of the amount capable of forming a coagulum. The coagulating ability is proportional to the agglutinating ability.—*C. H. Farr.*

3792. MACDOUGAL, D. T. *The arrangement and action of material in the plasmatic layers*

and cell-walls of plants. Proc. Amer. Phil. Soc. 63: 76-93. 2 fig. 1924.—This paper constitutes a summary of several previous publications by the author, to which are added further experimental results with constructed cells and with freshly cut and also dried sections of *Opuntia*, dealing with the distention of cells in acids, hydroxides, and neutral salt solutions, and with the influence of concentration of cell contents on adsorption of ions from the immersion liquid.—*Wanda Weniger*.

3793. MAYER, ANDRÉ, AND L. PLANTEFOL. Sur les échanges d'eau des mousses avec l'atmosphère. [The exchange of gases between mosses and the atmosphere.] Compt. Rend. Acad. Sci. Paris 179: 204-206. 1924.—This is a discussion of the vapor tension equilibrium with the moss at varying degrees of hydration, also the rapidity of adjustment, the residual water, and the mechanics of gaseous exchange. It is found that the moss takes up or loses water to the atmosphere until the water content reaches an equilibrium. The vapor tension rises with rise in temperature, doubling for each 10°C. between 14° and 37°. The rapidity of adjustment of the equilibrium depends upon the water content of the moss, the vapor tension of the medium, and the temperature. Mosses hold a little water even at 100°C. In *Hypnum triquetrum* this amount is 5-6%. It has previously been supposed that the force involved in gaseous exchange was osmotic pressure. However, the pressure required to desiccate a moss to 8% would be equivalent to the pressure of 3000 gm. of NaCl in a liter of water. If a moss with 8% water is placed in a saturated solution of NaCl it will take up water and become 18% water. The force involved in resisting desiccation and absorbing water is regarded as imbibition.—*C. H. Farr*.

3794. MUDD, STUART, AND EMILY B. H. MUDD. Observations on bacteria in films, and the surface tension factor in phagocytosis. Proc. Soc. Exp. Biol. and Med. 22: 4-5. 1924.—Bacteria trapped in the liquid-liquid interface can escape by 3 methods, depending on tension. The authors agree with Fenn that surface tension would retain the bacteria in the interface unless the condition of complete spreading obtained.—*M. M. Brooks*.

3795. SEN, B. On the relation between permeability variation and plant movements. Proc. Roy. Soc. London B 94: 216-231. 1923.—A method is described for measuring resistance of plant tissues, the method depending upon balancing the natural e.m.f. of the tissue by means of a special compound potentiometer, then measuring intensity of the natural current by means of a sensitive galvanometer. Applied to stimulated pulvini of *Mimosa* and other plant tissues this method showed a marked decrease of resistance following stimulation. Such decrease of resistance is interpreted as due to exosmosis of electrolytes through the cell membranes, the author believing that other possible sources of decrease were eliminated.—*P. B. Sears*.

3796. SLATER, F. P. A sensitive method for observing changes in electrical conductivity in single hygroscopic fibres. Proc. Roy. Soc. London B 96: 181-193. Fig. 1-6. 1924.—The conductivity changes of single cotton hairs under controlled humidity and temperature are here traced. The method consists in measuring the rate of leak which the hair is able to produce across the insulated system of an electroscope. About 24 hours has to be allowed for the hair to reach equilibrium following a humidity change, although initial response is very rapid. The behavior of different hairs shows considerable individual variation, and seems to be affected by previous history in certain cases.—*P. B. Sears*.

3797. STILES, WALTER. Permeability. New Phytol. 22: 128-149. Fig. 15. 1923.—In a continuation of chapter 12 (quantitative relations in the penetration of dissolved substances into plant cells), consideration is given to the influence of temperature, light, and the thickness of tissue on the rate of absorption. The course of absorption in general is discussed. The chapter closes with an extended discussion (16 p.) of the influence of the presence of one dissolved substance on the absorption of another. The discussion centers on antagonism.—*I. F. Lewis*.

3798. STILES, WALTER. Permeability. New Phytol. 22: 204-224. Fig. 16. 1923.—Chapter 13 in this series of papers includes sections on reversible and irreversible changes in cell permeability, and the effect of temperature, light, dissolved substances, changes in turgor, wounding, and seasonal changes. Chapter 14 discusses the theories of permeability; ultrafiltration, lipid, and colloid precipitation theories.—*I. F. Lewis*.

3799. STILES, WALTER. **Permeability.** *New Phytol.* 22: 239-280. 1923.—The continuation of chapter 14 (see previous abstract) is devoted to theories of permeability, as follows: the viscosity theory, the phase inversion hypothesis, Lloyd and Free's colloidal hypothesis, Tröndle's theory of protoplasmic irritation, the adhesion theory, the theories of chemical combination and absorption, and electrical theories. The concluding remarks are contained in chapter 15, which is followed by a literature list of 817 titles.—*I. F. Lewis.*

WATER RELATIONS, TRANSPORT

3800. BOSE, JAGADIS CHUNDER. **Physiologie des Saftsteigens.** [Physiology of the rise of sap.] (Translated from the English into German by E. G. PRINGSHEIM.) Gustav Fischer: Jena, 1924.—(See also Bot. Absts. 12, Entry, 5176.)

3801. IMMINK, D. H. **Waterverdeeling in den verschen stam.** [Distribution of moisture in a green log.] (With summary in English.) (Korte Mededeel. Proefstat. Boschw. No. 3.) Tectona 16: 499-511. *Fig. 30-40.* 1923.—The distribution of water in a transverse section through the heartwood of 3 teakwood trees (*Tectona grandis* L.f.) and of 2 species of mahogany trees (*Swietenia mahagoni* Jack. and *S. Macrophylla* King, each 1 tree) was determined, and found to be very similar to the moisture distribution of *Acer pseudoplatanus*, as presented by W. G. CRAIB (Regional spread of moisture in the wood of trees. Notes Roy. Bot. Gardens Edinburgh No. 51 and 59). There is no correlation between trend and width of the annual rings and the moisture-distribution in a disc. The author thinks it probable that at certain periods the sap moves up from places with a low to places with a high water-percentage, and he questions the correctness of the current opinion which considers heartwood a dead substance.—*Charles Coster.*

3802. PESSIN, LOUIS J. **A physiological and anatomical study of the leaves of Polypodium polypodioides.** *Amer. Jour. Bot.* 11: 370-381. 1 *pl.*, 3 *fig.* 1924.—Under dry conditions the leaf of this species curls upward, closing the upper surface and leaving the lower exposed. Loss of water was found to take place about twice as fast from the lower surface as from the upper. Experiments with leaves in a moist chamber show that they absorb a considerable quantity of water, but whether this is by imbibition of water condensed on the surface or by penetration of water vapor through the stomata is uncertain. Leaves in moist chambers increased in weight 10 times as fast when the upper surface was sealed as they did when the lower one was sealed. The curling of the living leaf is apparently the result of osmotic phenomena; the expansion, in the case of dead leaves, is entirely due to imbibition, but in the living ones is due both to imbibition and to osmosis. The leaf scales, which originate from epidermal cells near the growing point of each pinna, probably facilitate an equal distribution of rain water over the leaf surface and aid in water absorption. No mycorrhizal fungus was seen in the roots of this fern.—*E. W. Sinnott.*

3803. STILES, WALTER. **Evaporation in wind. A criticism of the contribution of H. Sierp and K. L. Noack to the physics of transpiration.** *Ann. Bot.* 38: 299-304. 1924.—The author contributes a critical analysis of the data and conclusions of Sierp and Noack (*Jahrb. Wiss. Bot.* 60: 459-498. 1921). He points out that these investigators were unaware of important papers by THOMAS and FERGUSON (*Ann. Bot.* 31: 241-255. 1917; *Phil. Mag.* 34: 308-321. 1917) and JEFFREYS (*Phil. Mag.* 35: 270-280. 1918). He criticises the experiments showing evaporation from a free water surface, likewise the failure to take account of the probable error. Under the circumstances he would interpret the results of Sierp and Noack as not inconsistent with the relations already well established, namely, that "the rate of evaporation from a free water surface of medium dimensions exposed to a wind is proportional to $a^{1.4}$, where a is proportional to the linear dimensions of the surface." Again, the author considers that such data as were secured by Sierp and Noack on evaporation through multiperforate septa, contrary to the view of the latter, appear quite consistent with the wet law.—*B. M. Duggar.*

3804. T., J. McL. **The ascent of sap and transport of food materials in trees.** *Nature* 114: 518-519. 1924.—This is a report of a discussion at the Toronto meeting of the British Association. Comments by Dixon, Blackman, Curtis, MacDougal, Priestley and Overton are given.—*O. A. Stevens.*

MINERAL NUTRIENTS, SALT RELATIONS

3805. HOBART, F. G. Calcium in plant metabolism. *Pharm. Jour.* 113: 500. 1924.—The main theories concerning the utility of the Ca ion may be classed under 3 headings, namely: (1) Direct concern in carbohydrate transport; (2) fixation of oxalic acid; (3) vehicle for the absorption of sulphur and phosphorus. While it is true that the acid oxalate of potash, in common with other acidic substances, retards and in sufficient concentration prevents the action of diastase on starch, the theory that Ca has much, if anything, to do with carbohydrate transport is pretty well exploded. Certainly in connection with all 3 points, its place could easily be taken by K, Na, or Mg. It is well established, however, that Ca is essential to normal, vital functioning and probably the real explanation of the necessity of Ca (and other elements) is along the lines of protoplasmic stimulation and perhaps could be compared, after a fashion, with the dependence of the higher animal organisms upon the stimulation by complex endocrine secretions.—*E. N. Gathercoal.*

PHOTOSYNTHESIS

3806. COLIN, H., AND A. GRANDSIRE. Feuilles vertes et feuilles chlorotiques; les matières ternaires. [Green and chlorotic leaves; the ternary compounds.] *Compt. Rend. Acad. Sci. Paris* 179: 288-291. 1924.—A study is made of *Aesculus Hippocastanum*. No starch is found in the chlorotic leaves and less sugar. There are more glucosides in the chlorotic leaves in early spring, and less in late spring, but the difference is not great, as is also true of the fat content. The pectic bodies, however, are much less abundant in the chlorotic leaves, especially in late spring.—*C. H. Farr.*

3807. HARTRIDGE, H. The coincidence method for the wave-length measurement of absorption bands. (Abstract) *Proc. Roy. Soc. London B* 94: 335. 1923.—A refined method for measuring the mean wave length of absorption bands is described, based upon a device for setting into coincidence the dark bands of 2 parallel, identical, but mutually reversed spectra by means of a properly calibrated micrometer. The apparatus is especially designed for quantitative work with pigments. In estimating percentage saturation of blood with CO₂, an accuracy of measurement was obtained approximating 0.6 A. U.—*P. B. Sears.*

3808. ROMIEU, MARC. Observations histologiques, histochimiques et spectroscopiques sur le pigment vert du Chétoptère. [Histological, histochemical and spectroscopic observations on the green pigment in Chaetopterus.] *Bull. Biol. France et Belgique* 56: 579-597. 1922.—Chaetopterin, a green pigment present through the whole length of the digestive tube of *Chaetopterus*, is similar to chlorophyll in most physical and chemical properties. It presents a spectrum almost exactly superposable on that of *Ulua*, the remains of which serve as food for *Chaetopterus*.—*Neil Hotchkiss.*

3809. SPIRGATIS, PAUL. Untersuchungen über den Wachstumsfaktor Kohlensäure. [Carbon dioxide as a growth factor.] *Bot. Archiv.* 4: 381-402. 11 fig. 1923.—In its effect as a factor of growth, CO₂ is not constant: it increases with increasing light intensity.—*William Seifriz.*

3810. SPOEHR, H. A. Photosynthesis and possible use of solar energy. *Ann. Rept. Smithsonian Inst.* 1922: 175-185. 1924.—The process of photosynthesis by which plants utilize directly the sun's energy contrasts them with animals. The waste of solar energy is great, comparatively little having been stored by plants as coal, oil, etc. An outline is given of energy resources with a view toward conserving more solar energy. The utilization of natural photosynthesis is probably more important than any mechanical means of directly transforming solar energy. Possibilities of fuel production from grains and from cellulose are outlined. There is necessity for a more complete understanding of the process of photosynthesis.—*Neil Hotchkiss.*

3811. STEINECKE, FR. Ueber Beziehungen zwischen Färbung und Assimilation bei einigen Süßwasseralgen. [The relations between color and assimilation of some fresh water algae.] *Bot. Archiv.* 4: 317-327. Fig. 1-4. 1923.—Schizophyceae of the East Prussian moors often lack the typical blue-green color, being weak blue-green, yellow-green, or even straw-green. Experiments show that this is due to lack of nitrates. Since the red and blue rays

are responsible for assimilation and are best used by the green and yellow pigment carriers, then the absence of green color makes the red rays function less, resulting in reduced assimilation. This is in keeping with the low salt content of the moors which would not permit full assimilation. Less pronounced are the variations in color intensity of the Chlorophyceae.—*William Seifriz.*

3812. WEEVERS, TH. The first carbohydrates that originate during the assimilatory process. A physiological study with variegated leaves. *Proc. Roy. Acad. Sci. Amsterdam* 27¹⁻²: (1-11). 1923.—The variegated leaves of *Pelargonium zonale* contain only saccharose while the green leaves contain also monosaccharides. The variegated leaves, freed of sugar by placing them in darkness, on subsequent illumination, contained 1st monosaccharides then saccharose and starch. It is hence probable that monosaccharides are the 1st products of photosynthesis. Which monosaccharide is 1st formed has not been established, though fructose seems to predominate. The variegated parts of the leaves containing saccharose contain invertase.—*H. A. Spoehr.*

METABOLISM (GENERAL)

3813. ALPERS, K., UND H. ZIEGENSPECK. Beiträge zur Beurteilung der Stärkebestimmungs-verfahren. [Contributions toward revision of starch-determination processes.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 45: 163-174. Pl. 5. 1923.—The paper is mainly of chemical interest.—*E. E. Stanford.*

3814. ANDERSON, R. J., AND F. P. NABENHAUER. A contribution to the chemistry of grape pigments. II. Concerning the anthocyanins in Clinton grapes. *Jour. Biol. Chem.* 61: 97-107. 1924.—The pigment occurring in Clinton grapes consists principally of a monoglucoside, anthocyanin, which is easily hydrolyzed by boiling with dilute HCl yielding 1 molecule each of glucose and anthocyanidin chloride ($C_{17}H_{15}O_7Cl$), the latter crystallizing from the hot solution in prisms. The absorption spectra of anthocyanin chloride and anthocyanidin chloride consist of 1 broad band extending from the yellow into the blue.—*G. B. Rigg.*

3815. ANDERSON, R. J. A contribution to the chemistry of grape pigments. III. Concerning the anthocyanins of Seibel grapes. *Jour. Biol. Chem.* 61: 685-694. 1924.—The anthocyanin occurring in Seibel grapes is a monoglucoside and it appears to be identical with oenin, the glucoside derived from *Vitis vinifera*. The pigment was isolated as the picrate, which crystallized in red needles. The anthocyanin chloride crystallized in long prisms and corresponds to the formula $C_{28}H_{25}O_{12}Cl + 3H_2O$. Attention is drawn to the fact that in a cross between European and American varieties of grapes, such as the Seibel seedlings, the pigment peculiar to *Vitis vinifera* is inherited by the hybrid.—*G. B. Rigg.*

3816. COLIN, H., ET V. ESTIENNE. Utilisation des lévulosanes par les organismes. [Utilization of levulosans by organisms.] *Bull. Soc. Chim. Biol.* 6: 431-435. 1924.—The inulin of the Compositae, levosine from cereals, irisine from the iris, scilline from *Urginea maritima*, and a levulose-yielding substance obtained from species of *Allium* are alike in a great many of their properties. The higher animals do not possess digestive enzymes capable of splitting these compounds, and it is not possible to isolate such enzymes in active form from the plants which produce these substances. *Aspergillus niger*, and *Mucor Boulard* make very poor growth when the spores are sown in a medium containing pure inulin freed of reducing sugars. The digestion is apparently intracellular, as neither inulase nor levulose can be isolated from the nutritive solution. Scilline and irisine are even less favorable media for these fungi, and attempts to isolate enzymes capable of attacking them have given negative results. Scilline, irisine, and the levulosans in general are, therefore, to be classed with the gums, mucilages and pectins as substances which may be used by the plants which elaborate them, but which cannot serve as sources of nutriment for other organisms.—*Joseph S. Caldwell.*

3817. COMBES, RAOUL, ET DENISE KOHLER. Étude biochimique de la chute des feuilles. [Biochemical study of leaf fall.] *Bull. Soc. Bot. France* 69: 539-545. 1922.—The author experimented with *Fagus sylvatica* and *Aesculus Hippocastanum*. In the 1st table, 3 sets of 50 leaves each from *Fagus sylvatica* were analyzed: (1) Leaves collected at the beginning of yellowing, (2) leaves having become brown on the tree, and (3) leaves having become brown at the side of the tree (cut off at the time when the 1st set was collected, the petioles placed in water, and allowed to stand at the base of the tree).—In the 2nd table are given the analyses

of similarly secured sets of 10 leaves from *A. Hippocastanum*. The conclusions are: In the normal course of yellowing and dying, the soluble carbohydrates diminish by about $\frac{1}{2}$. In the browning and dying of leaves cut from the tree at the beginning of the yellowing, only about $\frac{1}{3}$ of these soluble carbohydrates are lost.—*P. A. Young.*

3818. COSTER, CH. Die physiologische und pathologische Kernholzbildung bei *Tectona grandis* L.f., nebst Bemerkungen über die Bildung des Wundholzgummis. [Physiological and pathological heartwood formation of *Tectona grandis* L.f. with remarks about the pathological wood gums.] Ann. Jard. Buitenzorg 34. 1^e Partie A: 1-16. Pl. 1-3. 1924.—A description is given of the normal heartwood of *Tectona grandis* L.f. with its typical resin-like contents. By the conversion of sapwood into heartwood the moisture increases about 12%. The pathological heartwood which is formed about an injured place differs from the sapwood by its darker color and by the conversion of the starch into wood gum. In 4 different ways it is shown that this wood gum is formed from the reserve material in dead cells through the activity of the still "living" wood-enzymes. It is emphasized that this process is different from the normal conversion of sapwood into heartwood, which is considered the result of aging.—*Author.*

3819. COSTER, CH. Physiologische en pathologische kernhoutvorming en de in het laatste geval optredende wondgommen bij den djati, *Tectona grandis* L.f. [Physiological and pathological heartwood formation and the pathological wood gums of *Tectona Grandis* L.f.] (With a summary in German.) *Tectona* 17: 620-628. 1924.—[See preceding abstract.]

3820. EDDY, WALTER H., RALPH W. KERR, AND R. R. WILLIAMS. The isolation from autolyzed yeast of a crystalline substance melting at 223 degrees, having the properties of bios. Jour. Amer. Chem. Soc. 46: 2846-2856. 1924.—This crystalline substance met the established criteria for chemical purity. In minute doses (0.005 mg. per cc.) it markedly stimulated yeast growth. Its effect varies with the type of yeast used. It stimulated top growing yeast less than bottom growing yeast. It does not have anti-neuritic power, so it is not vitamin B. The chemical formula is $C_5H_{11}NO_3$; its chemical structure is undetermined.—*J. M. Brannon.*

3821. ELFRING, FREDR. Über die Bildung organischer Säuren durch *Aspergillus niger*. [The production of organic acids by *Aspergillus niger*.] Öfversigt Finska Vetensk.- Soc. Förhandl. 61 A¹⁵: 1-23. 1918-1919.—A covering of *Aspergillus niger* on a pure solution of dextrose, saccharose, mannite, inulin, dextrin, glycerol, pepton, or asperagin produces considerable oxalic acid. Still more acid is produced if the solution is alkaline.—Besides oxalic acid, *A. niger* produces citric acid, often more copiously than the former. This acid also is consumed later on, and elected in advance of the oxalic acid. Different races of *A. niger* have different capacities to produce acids, some developing only citric acid. Ca salts prevent the appearance of oxalic acid but not of citric acid. The oxalic acid is probably produced, in part at least, not directly from the sugar, but, as we must assume in the case of the citric acid, through the decomposition of complex compounds.—*R. Collander.*

3822. FOSSE, AND A. HIEULLE. Sur une réaction colorée, supposée spécifique de l'aldéhyde formique, produite par l'acide glyoxylique. [A color reaction supposed to be specific for formaldehyde, produced by glyoxylic acid.] Compt. Rend. Acad. Sci. Paris 179: 636-638. 1924.

3823. FRANZEN, HARTWIG, UND HANS KAISER. Über die chemischen Bestandteile grüner Pflanzen. XXVIII. Über die durch Bleiacetat fällbaren Säuren der Tamarinden (*Tamarindus indica*). [The chemical constituents of green plants. The acids of tamarind.] Zeitschr. Physiol. Chem. 129: 80-94. 1923.—The author finds as a result of this investigation that the acids of tamarind precipitable by lead acetate consist principally of tartaric acid, together with limited quantities of malic acid and traces of oxalic, succinic, and citric acids.—*Frederick V. Rand.*

3824. GORIS, A. Sur la composition chimique des fruits verts de vanille et le mode de formation du parfum de la vanille. [The chemical composition of green fruits of vanilla, and the mode of formation of their perfume.] Compt. Rend. Acad. Sci. Paris 179: 70-72. 1924.—It is found that the odor is due to the fermentation of vanilline. Three glucosides are found present—glucovanilline, glucovanillic alcohol, and a glucoside which breaks down into an ether with a strong odor. It is probable that the glucovanillic alcohol gives rise to glucovanilline, the latter giving the vanilline, which yields the odor.—*C. H. Farr.*

3825. GRIEBEL, C. Über das Vorkommen von Hesperidin ausscheidungen in Apfelsinen. [Occurrence of hesperidin deposits in sweet oranges.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 45: 238-240. 1 fig. 1923.—Hesperidin, which normally occurs dissolved in the cell-sap of sweet oranges (*Citrus* spp.) has been found deposited in sphaero-crystalline form in parenchyma-cells of the endocarp of oranges toward the end of the importing season. These oranges are usually shrunken and more or less bitter.—*E. E. Stanford.*

3826. GUSTAFSON, FELIX G. Total acidity compared with actual acidity of plant juices. Amer. Jour. Bot. 11: 365-369. 6 fig. 1924.—*Zea mais*, *Cucurbita maxima*, *Helianthus* sp. and *Bryophyllum calycinum* were studied. The total acid of the plant juice was found not to be responsible for the H-ion gradient which occurs. There is no constant relation between total acidity and actual acidity in these plants.—*E. W. Sinnott.*

3827. PASCHER, A. [Rev. of: BORESCH, KARL. Über die Pigmente der Alge *Palmelloccoccus miniatus* Chodat var. *porphyra* Wille. (The pigments of the alga *P. miniatus* Chodat var. *porphyra* Wille.) Ber. Deutsch. Bot. Ges. 40: 288-291. 1 fig. 1922 (see Bot. Absts. 12, Entry 4488).] Arch. Protistenk. 49: 136-137. 1924.

3828. PASCHER, A. [Rev. of: MEVIUS, WALTER. Beiträge zur Kenntnis der Farbstoffe und der Membranen von *Haematococcus pluvialis*. (The pigments and membrane of *H. pluvialis*.) Ber. Deutsch. Bot. Ges. 41: 237-242. 1923 (see Bot. Absts. 13, Entry 2989).] Arch. Protistenk. 49: 135-136. 1924.

3829. PICARD, F. Observations sur la solubilité des tanins et leur extraction chez les végétaux. [Observations on the solubility of tannins and their extraction from plants.] Compt. Rend. Acad. Sci. Paris 179: 480-483. 1924.—A review is given of previous work and methods. It is shown that neither ether nor boiling water will extract all of the tannins.—*C. H. Farr.*

3830. PICARD, F. Contribution à l'étude du rôle physiologique des tanins. Leur importance dans l'aoulement des sarments de la vigne. [A contribution to the study of the physiological function of the tannins. Their importance in the maturation of the grape shoots.] Compt. Rend. Acad. Sci. Paris 179: 778-780. 1924.—Data are presented which show that the density of a twig does not indicate the degree of its development. The pith is better developed as the rays are larger. The xylem, phloem, and cortex are more prominent in well developed shoots than in poorly developed ones. The amount of dry substance increases with the degree of development. The proportion of starch is greater in well developed shoots than in poorly developed ones. The quantity of tannins is not, it seems, related to the degree of development. The results show that it is impossible to determine the degree of development by the measurement of the different elements or by the amounts of starch or tannin.—*C. H. Farr.*

3831. REISS, P. Remarques sur le pH intérieur du noyau cellulaire et ses variations expérimentales. [Remarks on the pH of the interior of nuclei and the experimental variations.] Compt. Rend. Acad. Sci. Paris 179: 641-643. 1924.—Experiments were performed on the eggs of the sea-urchin. The authors hesitate to regard their findings as the basis for a general theory. They find that some substances, especially narcotics, lower the pH of the nucleus.—*C. H. Farr.*

3832. RIVIÈRE, GUSTAVE, AND GEORGES PICHARD. Contribution à l'étude des principes immédiats contenus dans les feuilles et l'épiderme des fruits du pommier. [A contribution to the study of the principles contained in the leaves and epidermis of apple fruits.] Compt. Rend. Acad. Sci. Paris 179: 775-777. 1924.—This paper confirms Sando's findings of $C_{30}H_{48}O_8$, which he called malol. But they disagree with Sando as to the monoacetylmalol, acetylmethylmalol, and diacetylmalol. They suggest replacing the name malol with maloloic acid. The monoacetylmalol of Sando, they claim, is monoacetone, and his diacetylmalol is acetine.—*C. H. Farr.*

3833. ROSENTHALER, L. Beiträge zur angewandten Drogenkunde. 2. Beobachtungen an Stärkekörnern. [Applied pharmacology. 2. Starch grains.] Schweiz. Apoth. Zeitg. 61⁴⁸: 6 p. 1923.—The differences in staining between starch grains of different species are merely quantitative. Grains of the same plant vary in respect to dyes. On the other hand 15.5% of HCl and n/6.25 KOH are useful in the differentiation of many morphologically similar starch grains. The cause of the differing behavior is to be attributed to the outer layer of the starch grain.—*S. Blumer.*

3834. ROSENTHALER, L. Ueber das gemeinsame Vorkommen von Alkaloiden und Tanninen in Pflanzenzellen. [The combined occurrence of alkaloids and tannoids in plant cells.] (Abstract.) Mitteil. Naturf. Ges. Bern 1923: liii-liv. 1924.

3835. ROSENTHALER, L., UND M. MOSIMANN. Studien über die natürliche chemische Form der Alkaloide. 1. Über das gemeinsame Vorkommen von Alkaloiden und Tanniden. [The chemical form of the natural alkaloid. 1. The combined occurrence of alkaloids and tannoids.] Schweiz. Apoth. Zeitg. 62: 13-15, 29-31, 48-50. 1924.—Investigating the occurrence of alkaloids and tannoids in the same cells, the author found that the alkaloids could be chemically demonstrated in their tannoid combination by the use of strong alkaloid-reagents. No tannoids were found in the subterranean organs of *Atropa Belladonna*, *Hyoscyamus niger*, *Veratrum album*, *Hydrastis canadensis*, in the leaves of *Cytisus Laburnum*, in the milky sap of *Chelidonium majus* and *Papaver somniferum*, also in the seed of *Schoenocaulon officinale* (*Sabadilla officinalis*). The seed of *Areca Catechu* contain alkaloid in the endosperm but no tannoid, while the cotyledons contain tannoid. The seed of *Physostigma venenosum* (Calibar beans) contain tannoid in the seed coats and alkaloid in the cotyledons. In the seed of *Cola vera* and *Coffea arabica*, in the bark of *Punica granatum* and *Cinchona*, as also in the spongy parenchyma of *Taxus baccata*, alkaloid and tannoid occur together in nearly all cells of the tissues. In the leaves of Solanaceae the tannoids are localized in the epidermis, especially in the heads of the glandular cells. In the seed coats of *Colchicum autumnale* and *Conium matulatum* the alkaloid occurs only in connection with the tannoid.—S. Blumer.

3836. SCHMALFUSS, HANS. Über Pflanzensäuren aus Glaucium und über dessen Blütenfarbstoffe. [Plant acids of Glaucium and their blossom pigments.] Zeitschr. Physiol. Chem. 131: 166-167. 1923.—The percentages of the acids found were as follows: Citric, 25.82; lactic, 18.24; acetic, 11.88; succinic, 1.99; fumaric, 21.59; malic, 13.50; anhydrous malic, 5.92; dihydroxymaleic [Dioxy-(2-3)-Buten-(2)-disäure-(1.4.)], 1.07; formic, traces. Hitherto only fumaric acid had been found in *Glaucium*. The strongly thermolabile dihydroxymaleic, referred to above, is reported for the 1st time in the plant kingdom.—The orange pigment of the petals was related to the lipochromes and the black spots were found to owe their color to neutral anthocyan.—Frederick V. Rand.

3837. SHWARTZMAN, GREGORY. Food accessory substances in bacterial growth. I. The influence of initial hydrogen-ion concentration of media on the growth promoting effect of tomato extract. Proc. Soc. Exp. Biol. & Med. 22: 7-9. 1924.—Tomato extract has no growth promoting effect in media of pH 5.2-6.2; the best effect is at pH 8.2-8.6.—M. M. Brooks.

3838. SHWARTZMAN, GREGORY. Food accessory substances in bacterial growth. II. The variations of hydrogen-ion concentration occurring in bacterial cultures containing tomato extract. Proc. Soc. Exp. Biol. & Med. 22: 42-44. 1924.—The time required to bring the pH of a culture medium containing tomato extract to its limiting H-ion concentration depended upon the initial pH of the medium.—M. M. Brooks.

3839. SHWARTZMAN, GREGORY. Food accessory substances in bacterial growth. III. Their fate in bacterial cultures. Proc. Soc. Exp. Biol. & Med. 22: 44-47. 1924.—The formation of unknown factors by actively multiplying bacterial cells is the cause of the disappearance of food accessory substances from tomato extract cultures of *Bacillus Shiga*.—M. M. Brooks.

3840. WOOD, E. M. Contributions to an investigation of the chemical nature of the cellulose membrane. Ann. Bot. 38: 273-398. 1924.—In this investigation the material used included root tips as well as parenchymatous stem tissues of *Vicia Faba*, *Helianthus annuus*, *Galtonia*, *Hyacinthus*, etc. In all cases the material was selected with a view to having the "constituents of the cell wall in form nearest to that in which they were laid down after cell-division." The choice of fixatives was found to be a most important matter. Extensive tables are given showing the characteristics of fixatives and dyes, also the effects of these on the tissues employed. In general, pectin, is stained by organic stains which are hydrochlorides of amines, and cellulose by alkali salts of disulphonic acids of compounds containing one or more azo groups. The author holds that "The chemical state of the membrane probably takes the form of an equilibrium between cellulose proper, hydrocellulose, and oxycellulose," the 2 first mentioned predominating.—B. M. Duggar.

METABOLISM (NITROGEN RELATIONS)

3841. BAUMAN, E. J. A simple method for preparing large quantities of yeast nucleic acid as a magnesium compound. *Jour. Biol. Chem.* 61: 1-4. 1924.

3842. CHIBNALL, A. C. Spinacin, a new protein from spinach leaves. *Jour. Biol. Chem.* 61: 303-308. 1924.—By applying the ether method described in a recent paper, a new protein, spinacin, has been prepared from the cytoplasm of spinach leaves (*Spinacia oleracea*). It is insoluble in water and salt solutions but is soluble in a very small excess of either acid or alkali. It contains 16.25% of nitrogen and is free from carbohydrate. The protein appears to be present in the cytoplasm as an anion and at a hydrogen ion concentration only slightly lower than of its isoelectric point.—*G. B. Rigg*.

3843. CHIBNALL, A. C., AND L. S. NOLAN. A protein from the leaves of the alfalfa plant. *Jour. Biol. Chem.* 62: 173-178. 1924.—A protein similar in physical and chemical properties to spinacin recently prepared from spinach has been prepared from the cytoplasm of the leaves of the alfalfa plant, *Medicago sativa*.—*G. B. Rigg*.

3844. CHIBNALL, A. C., AND L. S. NOLAN. A protein from the leaves of *Zea mays*. *Jour. Biol. Chem.* 62: 179-181. 1924.—A protein closely resembling spinacin from spinach leaves and the similar protein from alfalfa leaves has been prepared from the leaves of ensilage corn, *Zea mays*. It was not obtained free from carbohydrate, but this is believed to have been present as an impurity.—*G. B. Rigg*.

3845. GRIEBEL, C. Zum Vorkommen von Tyrosin-sphäriliten in Leguminosemehlen. [Occurrence of tyrosin sphaero-crystals in legume flours.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 45: 237-238. *Fig. 1*. 1923.—The excrement of legume-weevils (*Laria pisi* and *Laria* spp.) contains sphaero-crystals of tyrosin, which appear to be formed from legumin. The occurrence of such sphaero-crystals in legume flours may be taken as an indication of weevil damage. It has been demonstrated in flours of peas (*Pisum sativum*), lentils (*Ervum Lens*), and horse-beans (*Vicia faba*). A sample of Brazilian beans (*Phaseolus* sp.) showed weevil-holes, but no insects. Excrement from the holes showed sphaero-crystals, probably of tyrosin, though differing somewhat from those usually observed. Excrement of the bread beetle (*Anobium paniceum*) fed on various legumes showed no tyrosin.—*E. E. Stanford*.

3846. HUCKER, G. J., AND W. A. WALL. The use of agar slants in detecting ammonia production and its relation to the reduction of nitrates. *Jour. Bact.* 7: 515-518. 1922.—A new technic for the detection of NH_3 produced by bacteria is given. A few cultures of bacteria produced NH_3 from a glucose medium, the only N ingredient of which was KNO_3 , without the intermediate production of nitrites in measurable quantities.—*C. E. Skinner*.

3847. JONES, D. B., C. E. F. GERSDORFF, AND O. MOELLER. The tryptophane and cystine content of various proteins. *Jour. Biol. Chem.* 62: 183-195. 1924.—The tryptophane and cystine content of proteins from 40 plant organs, mostly from seed, is reported.—*G. B. Rigg*.

3848. OSBORNE, T. B., C. S. LEAVENWORTH, AND L. S. NOLAN. A note on Dakin's method as applied to edestin. *Jour. Biol. Chem.* 61: 309-313. 1924.

3849. VICKERY, H. B. Some nitrogenous constituents of the juice of the alfalfa plant. I. The amide and amino acid nitrogen. *Jour. Biol. Chem.* 60: 647-655. 1924.—Work on the presence of individual substances in a group of plant species has been reported by Schulze (*Zeitschr. Physiol. Chem.* 24: 18, 1898). This paper emphasizes the different substances occurring in a single plant. Methods of extraction and separation are given. Asparagin was isolated. Other amids probably occur. Free amino acids occur in relatively small amounts. Tyrosin was isolated in a very small amount.—*G. B. Rigg*.

3850. VICKERY, H. B. Some nitrogenous constituents of the juice of the alfalfa plant. II. The basic nitrogen. *Jour. Biol. Chem.* 61: 117-127. 1924.—Arginin, lysin, stachydrin, cholin, and a chloride of purin were quantitatively determined. Attention is drawn to the inadequate knowledge of the simpler nitrogenous constituents of the juice of plants and to the desirability of further research in this field.—*G. B. Rigg*.

METABOLISM (ENZYMES FERMENTATION)

3851. ASCHOFF, KARL, UND HEINR. HAASE-ASCHOFF. Beitrag zur Kenntnis der Zusammensetzung der Wein-destillate und Branntwein. [Composition of wine-distillate and spirits.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 45: 209-211. 1923.

3852. BAUR, EMIL. *Notiz zur Milchsäuregärung der Glucose durch Peptone.* [Note on lactic acid fermentation of glucose by peptone.] *Zeitschr. Physiol. Chem.* 131: 65. 1923.—The author refers to a controversy with Barthel and Von Euler concerning the results of investigations on lactic acid fermentation of glucose (see Bot. Absts. 14, Entry 1898) and promises a full publication of his investigations later.—*Frederick V. Rand.*

3853. BODANSKY, A. *A study of a milk-coagulating enzyme of Solanum elaeagnifolium.* *Jour. Biol. Chem.* 61: 365-375. 1924.—The presence of a casein-coagulase (chymase) in the berries of *Solanum elaeagnifolium* has been demonstrated and the method of its separation is given. The enzyme has a higher optimum temperature (80-85°C.) than animal rennin. No activity of the enzyme was observed at 0°. Its activity is not appreciably affected by dialysis. It is found in appreciable amounts only in the berries of the plant. The plant is a weed whose berries are used locally in New Mexico and Arizona as a rennet substitute, and is known there as "horse-nettle."—*G. B. Rigg.*

3854. BOSZELMANN, H., UND A. KOCH. *Über das Schicksal des Arsens bei der Vergärung Arsenhaltiger Obstsäfte.* [Fate of arsenic in fermentation of arsenic-containing fruit-juices.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 46: 10-32. 1923.—The experiments described were undertaken because arsenicals from spraying materials may be expected to appear in fruit juices. Currant juice (*Ribes* spp.), to which various quantities or arsenicals (arsenious acid and Paris Green) were added, was used in most of the experiments. Arsenic content decreased during fermentation, owing partly to combination of the arsenic with the H₂S developed by the yeast; the arsenic sulphide is colloidal and is adsorbed by the yeast-cells. It could also be adsorbed by the isinglass-tannin precipitate. By using 5 mg. arsenic in 1 l. fermentation in flasks was checked; the same effect was produced by small quantities of copper.—*E. E. Stanford.*

3855. BRIDEL, MARC. *Sur l'hydrolyse fermentaire de la gentiacauline. Obtention d'un xyloglucose, le primevérose.* [The fermentation hydrolysis of gentiacauline. The occurrence of xyloglucose, the primeverose.] *Compt. Rend. Acad. Sci. Paris* 179: 780-782. 1924.

3856. DAKIN, H. D. *The formation of l-malic acid as a product of alcoholic fermentation by yeasts.* *Jour. Biol. Chem.* 61: 139-145. 1924.—Experimental evidence indicates that l-malic acid is a true product of fermentation by yeast and that significant amounts of the acid are formed when pure yeast cultures ferment pure sugar solutions.—*G. B. Rigg.*

3857. FLEURY, PAUL. *Lois d'action de la laccase: influence de la réaction du milieu.* [The law of laccase action: influence of reaction on medium.] *Compt. Rend. Acad. Sci. Paris* 179: 709-711. 1924.

3858. MCGUIRE, GRACE, AND K. G. FALK. *The influence of insulin on the glucose-fermenting action of Bacillus coli.* *Jour. Biol. Chem.* 60: 489-490. 1924.—The fermentation of glucose by *Bacillus coli* was not influenced by insulin. The literature of the occurrence of "insulin" and analogous bodies in less highly developed organisms such as shell fish and plants as well as in the animal body has been reviewed by JOSLIN (The treatment of diabetes mellitis, Philadelphia and New York, 3rd ed. 1923).—*G. B. Rigg.*

3859. NELSON, J. M. *Invertase in honey.* *Jour. Biol. Chem.* 61: 193-224. 1924.—Literature reporting the occurrence of invertase in fungi, and of sucroclastic enzymes in the roots and fruits of higher plants is cited. A method for obtaining an invertase from honey, in clear, transparent solutions, is described.—*G. B. Rigg.*

3860. PETERSON, W. H., E. B. FRED, AND E. G. SCHMIDT. *The fermentation of pentoses by Bacillus granulobacter pectinovorum.* *Jour. Biol. Chem.* 60: 627-631. 1924.—The fermentation of xylose and arabinose by *Bacillus granulobacter pectinovorum* results in the same products and in essentially the same quantities as from glucose.—*G. B. Rigg.*

3861. SAITO, KENDO. [Sorghum brandy investigations.] (Japanese.) *Mitteil. Zentr. Untersuchungsanst., Sudmanshur. Eisenbahnges.* 6: 1-144. 1921.—The Manchurian brandy "Kaoliang-chiu" is prepared from sorghum, using a special Chinese yeast "Chiizu." Approximately 50 microorganisms, occurring in Chiizu and in the mash, were studied. These included Phycomycetes, Ascomycetes, and imperfect forms among the filamentous fungi; a few Actinomycetes; yeasts and yeast-like forms; also bacteria of the acetic and lactic acid groups, of the butyric acid and amyl alcohol group, and a few other species.—Among the filamentous fungi investigated, *Endomyces Hordei*, *Thermoascus aurantiacus*, *Aspergillus Oryzae*, *Peni-*

cillium mandshuricum, *Rhizopus japonicus*, *R. tonkinensis*, *R. Oryzae*, and *Absidia Liehtheimi* are more or less strongly amylolytic species. They assist in inducing a rise of temperature in the crude substrate, and thus the thermophilous species in Chiizu succeed in developing.—The following enzymes were identified in Chiizu: amylase, maltase, invertase, emulsin, raffinase, lipase, protease, peroxydase and catalase.—In spite of the higher concentration of the lactic acid in the mash, the pH is ordinarily 3.5-4. At such H-ion concentrations diastatic action of the Chiizu is inhibited, which explains in part the poor alcohol yield of the Chinese industry.—*Author's abstract.* (Courtesy Japanese Jour. Bot.)

3862. SJÖBERG, KNUT. Über ein Amylasepräparat mit beschränktem Spaltungsvermögen. [An amylase preparation with limited hydrolytic power.] Zeitschr. Physiol. Chem. 131: 116-130. 1923.—By water extraction of triturated malt and subsequent dialysis of the solution, an enzyme preparation was obtained which transformed about 60% of the starch into maltose with uniform velocity. The remaining 40% could not be decomposed far enough not to give the starch reaction with iodine.—The influence of maltose and glucose on the velocity and extent of decomposition was investigated, and the non-hydrolyzable portion was precipitated by alcohol and its characteristics were partially defined. The investigation is being continued.—*Frederick V. Rand.*

3863. STURGES, WILLIAM S., AND LEO F. RETTGER. Bacterial autolysis. Jour. Bact. 7: 551-577. 1922.—From the results of determinations made by means of the quantitative biuret test of Vernon, the formol titration, the Van Slyke determination of amino acids, and the conductivity of the solutions, the authors reached the following conclusions: "Proteolytic bacteria of the type of *Erythrobacillus prodigiosus*, *Pseudomonas pyocyanea*, and *Bacillus subtilis* autolyze rapidly. *Bacterium coli* undergoes slight changes which may be autolytic in nature, but which at best involve only a small part of the complex nitrogenous constituent or constituents of the cells. The pathogenic cocci—pneumococcus, gonococcus, and meningococcus—undergo an actual autolysis with a breaking down of the protein or protein-like substances of the bacterial cells.—*C. E. Skinner.*

3864. VIRTANEN, ARTHUR T. Über die Kaseinspaltung durch Casei-Bakterien und Laktokokken. [Casein splitting by casei-bacteria and lactococci.] Soc. Sci. Fennica Comment Physico-Math. 14: 1-13. 1923.—*Bacterium casei* ϵ decomposes casein vigorously even at 20°C., if only at the beginning the culture is maintained around 40° for about 24 hours. Although *B. casei* ϵ is absent from old cheeses, in all probability it plays the chief role during the first 3 months in the ripening of Emmentaler cheese. It would seem that the casei bacteria and the lactococci supplement one another in casein decomposition.—*R. Collander.*

3865. VIRTANEN, ARTHUR T. Über die Propionsäuregärung. [Propionic acid fermentation.] Soc. Sci. Fennica Comment Physico. Math. 13: 1-23. 1923.—The organism experimented with was isolated from Emmentaler cheese, and is probably *Bacterium acidi propionici* var. *fusum* Thöni & Allemard. In the presence of air this species ferments lactic acid with the formation of propionic and acetic acids in the molecular ratio 2:1. Likewise, in the fermentation of dextrose there are produced as chief products propionic and acetic acids in the ratio 2:1 (also some quinic acid as a by-product). By the fermentation of tartaric acid, on the other hand, the propionic-acetic ratio is 1:1.8. Accordingly, the fermentation products from sugar and lactic acid agree qualitatively and quantitatively, while from tartaric acid the relative amounts of the end products are entirely different. It may be concluded that with this organism, in all probability, the intermediate product in sugar fermentation is not tartaric acid, as in other cases, but is lactic acid.—*R. Collander.*

METABOLISM (RESPIRATION)

3866. BECKING, L. B. The source of energy of the sulphur bacteria. Proc. Soc. Exp. Biol. & Med. 22: 127-129. 1924.—The author has investigated mass cultures of 9 genera of sulphur bacteria and concludes that it is not the H_2S *per se* that is assimilable, but rather the HS^- or the S^{--} ion which is the source of energy. Owing to the low concentration of the S^- ion in natural waters, the possibility is that the source of energy is derived from dehydrogenation of the HS^- ion in the absence of O. This implies the presence of an H acceptor in the same sense as used by Hopkins in his glutathione theory.—*M. M. Brooks.*

3867. SMITH, EDITH PHILIP. The effect of general anaesthetics on the respiration of cereals. 1. Carbon dioxide production. *Ann. Bot.* 38: 261-272. 9 fig. 1924.—Chloroform, ether and alcohol all had similar effects on the rate of respiration, as judged by CO_2 output. An initial decrease was followed by an increase to a maximum and this by a final decrease. With chloroform, recovery was possible only if the period of exposure was less than 15 minutes, while with ether recovery may occur after an exposure of several hours. Experiments with *Ipomæa* indicated that the effect may be due in part at least to changes in the permeability of the plasma membrane to CO_2 .—*W. P. Thompson.*

3868. SPOEHR, H. A., AND J. M. MCGEE. The effect of fluctuations in the CO_2 content of the atmosphere on the rate of respiration of leaves. *Amer. Jour. Bot.* 11: 493-501. 8 fig. 1924.—The rate of respiration of leaves was found to be not appreciably different in air containing 0.6% CO_2 by volume from that in air free of CO_2 . Changes in CO_2 content, however, produce certain temporary effects. When the CO_2 content of the air surrounding a leaf is changed from a lower to a higher concentration, the leaf shows a reduced rate of CO_2 emission for a period following the change, then increases, and finally again attains about the same rate as before the change in CO_2 content was made. Conversely, when the CO_2 content is changed from a higher to a lower concentration, the leaf shows a primary increased rate of CO_2 emission and subsequent decrease to the original rate. The intensity of this increased or decreased rate varies with different species of leaves, as does also the duration of the effect of the change. On the basis of this evidence the author emphasizes the necessity of great care in all experiments which endeavor to measure the rate of photosynthesis by the rate of emission or absorption of CO_2 .—*E. W. Sinnott.*

3869. TERROINE, E. F.-., S. TRAUTMANN, AND R. BONNET. Le rendement énergétique dans la croissance des végétaux supérieurs aux dépens des hydrates de carbone. [Energy yield in the growth of the higher plants as dependent on carbohydrates.] *Compt. Rend. Acad. Sci. Paris* 179: 342-344. 1924.—Terroine and his co-workers formerly established a value of 74% for the energy yield in the germination of rice and sorghum, and of 53% for peanuts and flax. The problem is now undertaken as to whether a seedling is dependent on the specific substances in its seed or can it use different carbon compounds. Inasmuch as Terroine and his co-workers have found that the energy yield value is a function not of the species, but of the composition of the seed, it may now be asked if the yield will be modified by supplying a ternary chain different from that habitually used. Seedlings of peanuts were decotyledonized, and grown in a nutrient solution with sugar and agar. Growth occurred in glucose, levulose, sucrose, and maltose, but not in arabinose, xylose, galactose nor lactose. It is found that fats are not indispensable to development. The energy yield is a function of the chemical composition of the food and not of the species. Levulose is slightly superior to the other sugars in its results.—*C. H. Farr.*

ORGANISM AS A WHOLE

3870. BERG, WILLIAM N. Twelve per cent dextrose media for prolonged anerobe growth. *Proc. Soc. Exp. Biol. & Med.* 22: 91-92. 1924.—This is a formula for preparing a medium which permits vigorous growth of anerobes.—*M. M. Brooks.*

3871. KNIGHT, R. C. The response of plants in soil- and water-culture to aeration of the roots. *Ann. Bot.* 38: 305-326. 1 fig. 1924.—Aeration of the soil in which maize is growing causes an increase in dry weight, but aeration of a nutrient solution has no effect. Wallflowers and *Chenopodium* on the other hand show a considerable increase in dry weight whether the solution is aerated by a stream of air or by *Elodea*. When a loam is sealed in pots the CO_2 content of the enclosed air increases rapidly, reaching 1% in 2 hours and 34% in 23 days.—*W. P. Thompson.*

3872. Любименко, В. Н. [LUBIMENKO, V. N.] Биология Растений Анализ приспособительной Деятельности растений. Часть I. Приспособления, связанные с ростом и развитием индивидуума. [Biology of Plants. Analysis of the adjustment activity of plants. Part I. Adjustments related to the growth and the development of the individual plant.] 359 p. Fig. 1-132. Государственное издательство Ленинград [State Printing Office, Leningrad.] 1924.—The history of the development of the organic world is a chain of

very complex interrelations between organic and inorganic matter, where instead of a controversy between 2 opposing powers, we see an interrupted tendency of the active beginnings of life to vanquish the passive resistance of the dead "milieu." This victory is completed with the aid of adjustment. Adjustment is a very complex physiological process. It is studied in plant physiology, but the latter has its own special problems and cannot study in detail the adjustments of the plant. There is a tendency to split up the study of these adjustments into a separate branch (to which the German scientists have given the unlucky name of "biology"). The perception of the adaptations related to growth and development may be conveniently referred to the different external factors which may influence these processes. All adaptations can be grouped as follows: (1) Adaptation to the temperature of the environment, (2) to the water régime, (3) to the osmotic pressure and the chemical composition of water, and (4) to the physical properties of the environment.—V. Lashevsky.

3873. PASCHER, A. [Rev. of: ULEHLA, V. Über CO₂ and pH Regulation des Wassers durch einige Süßwasseralgen. (Regulation of CO₂ and pH of water by several fresh-water algae.) Ber. Deutsch. Bot. Ges. 41: 20-31. 1 fig. 1923.] Arch. Protistenk. 48: 521-523. 1924.

3874. WILSON, G. S. The proportion of viable bacteria in young cultures with especial reference to the technique employed in counting. Jour. Bact. 7: 405-466. 1922.—A method for estimating the number of the total and the viable organisms in a culture medium is described. It is claimed that the experimental error involved in each count probably does not exceed 5%. Applying this to the study of the relation existing between the living organisms in a culture and the total number of organisms dead and alive, it is seen that even during the logarithmic phase the percentage of viable organisms seldom rises above 90% of the total. To explain this, a hypothesis is advanced which supposes that in a culture of *Bacterium suispestifer* in vitro there is a normal death rate among the bacteria, even during the logarithmic phase of growth. Assuming the presence of a normal death rate, it has been assumed possible to calculate the generation time on an altered basis, and this time has been found to be shorter than that usually given for cultures of similar organisms.—Author.

GROWTH, DEVELOPMENT, REPRODUCTION

3875. BRANSCHIEDT, P. Zur Kenntnis der experimentellen Beeinflussung der Wachstumsfaktoren in der Pflanze. [Influencing growth factors experimentally.] Bot. Archiv. 4: 181-195. Fig. 1. 1923.—Beheading the sunflower causes a pronounced swelling of the stem which sets in above, then later below. Extension of the bud region, especially the sieve part, is pronounced. Notable is the marked increase in the protrusion of the stomata of the stem beyond the epidermis. The guard cells may be carried out on a "chimney" 8 or 10 cells high. Of special interest is the formation and distribution of starch which, in *Helianthus annuus*, as in composites in general, is normally lacking except in the starch sheath.—William Seifriz.

3876. BRINK, R. A. The physiology of pollen. III. Growth in vitro and in vivo. Amer. Jour. Bot. 11: 351-364. 2 pl., 4 fig. 1924.—In *Muscari*, *Puschkinia*, *Chionodoxa* and *Scilla* pollen tubes were produced on artificial media which were long enough to have effected fertilization if they had been growing in the style. There is apparently a very close agreement between the behavior of the nuclei of pollen tubes growing in vitro and those growing in vivo. With pollen tubes grown in artificial media the amount of water available is important because of its effect (if not held within narrow limits) in causing the grain to burst, and because of its role in controlling enzyme activities in the various hydrolytic and synthetic reactions which attend growth. With pollen tubes grown in artificial media, if tube-length is plotted against time, an S-shaped growth-curve results. This is apparently an autocatalytic curve in which growth is ultimately slowed down because of lack of available food; for the amount of fat initially present in the pollen grain seems to be related to the potential length of the tube. With tubes grown in the style (as reported by East and Park) the curve is also of the autocatalytic type, but here the rate of growth in later stages shows no diminution. The author believes that the difference between tubes grown in vitro and in vivo is that in the former the excess of available water results in an excess of hydrolysis over synthesis and a consequent

exhaustion of food; but that in the latter the lesser amount of water allows the presence of synthesis to proceed fast enough so that sufficient food supply is maintained.—*E. W. Sinnott.*

3877. BRINK, R. A. The physiology of pollen. IV. Chemotropism; effects on growth of grouping grains; formation and function of callose plugs; summary and conclusions. *Amer. Jour. Bot.* 11: 417-436. 3 fig. 1924.—Pollen tubes of *Antirrhinum* and *Narcissus* grown on artificial media showed chemotropism not only for ovules but for placental tissue and ovary wall, so that the importance of chemotropism in determining the direction of pollen-tube growth in the ovarian cavity is problematical.—It was found that if the pollen grains were grown in groups (of 4 grains each) instead of singly, increases in growth amounting to about 40% were obtained. This is presumably due to more complete utilization, because of the proximity of the grains, of some diffusible growth-promoting substance produced by the growing tube. The fact that the growth-promoting substance produced by the tubes of one species stimulate tube-growth in a distantly related species indicates that these substances are not specific and that their activity thus cannot explain the phenomenon of self-sterility.—Tips of pollen tubes, cut off from the old portions by callose plugs, are capable of independent growth.

—*E. W. Sinnott.*

3878. DAUPHINÉ, ANDRÉ. Sur l'existence de l'accélération provoquée expérimentalement. [The existence of acceleration experimentally provoked.] *Bull. Soc. Bot. France* 69: 781-785. 3 fig. 1922.—This is another article on basifuge acceleration in roots of lupin when young roots are transversely sectioned above the root caps and placed on damp moss. After 24 hours, the author sees an acceleration of growth of the meristem of the central cylinder. This acceleration near the surface of the section chiefly affects the elements destined to become the primary xylem. In maturing, the structure of the root becomes abnormal. He discusses the works of Chauveaud and Gravis.—*P. A. Young.*

3879. HEUMAN, MARTIN. Über die Wachstumsbeschleunigung der Pflanzen bei vermindertem Sauerstoff-Druck. [Growth acceleration from reduced oxygen pressure.] *Bot. Archiv.* 4: 413-442. Fig. 1-4. 1924.—Plants under reduced oxygen pressure exhibit different effects in different structures. Monocotyledons suffer from reduced stem growth, but show increase in leaf development. On the contrary, dicotyledons show acceleration of stem growth especially, although this is not due to increased cell division. Growth acceleration due to oxygen hunger is to be regarded as a pathological phenomenon which is associated with an increase in the respiratory surface of the plant and therefore with a lessening of the supply of O_2 .—*William Seifriz.*

3880. MUNERATI. Observations sur la montée à graine des betteraves la première année. [Observations on the production of seed by beets during their first year.] *Compt. Rend. Acad. Sci. Paris* 179: 604-606. 1924.—The production of seed by beets the 1st year has been interpreted as an atavistic return to the wild annual habit. It seems, however, from all evidence available that the primitive type is biennial. It is found impossible to fix the biennial or the annual character by selection. The production of seed is known to result from arrested vegetative development. It is found that there are more annual beet plants in an early and fewer in a retarded season. But the annual features may arise in June or July when any arrest of vegetation is impossible. This is therefore not the sole condition. Some special cases are reported in detail.—*C. H. Farr.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

3881. BUCH, HANS. Über den Photo- und Hydrotropismus der Lebermoospflanze. [Phototropism and hydrotropism of liverworts.] *Öfversigt Finska Vetensk.-Soc. Forhandl.* 64 A²: (1-79). 2 pl. 1921-1922.—Most of the species examined, representing 16 genera, are transversally hydrotropic. Transverse hydrotropism is dependent upon a different reaction of the dorsal and ventral sides to the same stimulus. With 1-sided hydrotropic stimulation the shoots sooner or later turn their ventral sides toward the source of moisture. In an atmosphere similarly dry on all sides there occurs a bowed bending towards the ventral side. In *Lepidozia reptans* the stem may grow along the moist substrate, either side bending. The shoots of *Calypogeia Neesiana*, bearing brood bodies, are negatively hydrotropic.—The liverworts are in general, transversally phototropic. Still, comparatively few species orient them-

selves accurately at right angles to the direction of light. Most of them (*Marchantia polymorpha* for example) assume a more or less erect position, yet always such that the dorsal side is more strongly illuminated than the ventral side. Some few species are positively phototropic.—In the open the growth direction is influenced only by phototropism and hydrotropism, certain species being dominated by the one and some by the other.—*R. Collander*.

3882. CHMIELEVSKY, V. F. Phototaxis and the pressure of light. *Ann. Bot.* 38: 597–598. 1924.—It is suggested that the mechanism of phototaxis may be found in the pressure of light. In positive phototaxis the center of application of the pressure is presumably at the posterior end of the body so that the moving organism will always orient itself with the anterior end toward the source. In negative phototaxis this center of application is near the anterior end.—*W. P. Thompson*.

3883. T., W. B. [Rev. of: GOEBEL, K. Die Entfaltungsbewegungen der Pflanzen und deren teleologische Deutung. *Ergänzungsband zur "Organographie der Pflanzen."* (Movements of plants and their adaptational significance. Supplement to organography of plants.) 2 ed. x + 565 p. Justav Fischer; Jena, 1924.] *Nature* 114: 425–426. 1924.

GERMINATION, RENEWAL OF ACTIVITY

3884. DRĂGAN, I. C. Cercetări asupra germinației semințelor. [Germination of seed.] *Viața Agric.* [București] 13: 45–51. 1922.—The amount of water used in the swelling of barley and bean seed was experimentally determined.—*Al. Borza*.

3885. DURRELL, L. W. Stimulation of spore germination by CO₂. *Science* 60: 499. 1924.—Germination of spores of *Basisporium gallarum* is profuse in the presence of any plant tissue. It has been found that the action is due to the CO₂ of respiration.—*C. J. Lyon*.

3886. ROBERTS, H. F. Germination of seeds exposed to low temperature. *Nature* 114: 393. 1924.—A report is made upon 2 series of tests in which dry seed of many cultivated plants were exposed to winter temperatures from January to April. A part of each lot was kept inside, and tests in the spring gave essentially the same results from both sets. It is concluded that in layering of seed, the moisture rather than the temperature is the important factor.—*O. A. Stevens*.

3887. WOLFF, JULES. Nouvelles observations sur la perte du pouvoir germinatif des semences d'Orchidées. [New observations on the loss of the capacity for germination by seed of orchids.] *Compt. Rend. Acad. Sci. Paris* 179: 67–68. 1924.—This article is a continuation of a paper published earlier in the same journal (177: 554. 1923). (See Bot. Absts. 13, Entry 3916.) Aseptic germination was attempted on a gelose sugar medium containing the proper salts, a plant extract, or yeast water. It is found that, for an unknown reason, some fresh seed do not germinate. The capacity to germinate is lost in *Cattleya* hybrids in 45 days, and in *Odontoglossum* hybrids in 60 days. It is thus found that, contrary to the general opinion, the seed of the latter genus retain their germinative power longer than those of the first-named genus.—*C. H. Farr*.

TEMPERATURE RELATIONS

3888. COLLANDER, RUNAR. Beobachtungen über die quantitativen Beziehungen zwischen Tötungsgeschwindigkeit und Temperatur beim Wärmetod pflanzlicher Zellen. [The quantitative relations between death-velocity and temperature with the thermal death of plant cells.] *Soc. Sci. Fennica Comment. Biolog.* 17: 1–12. 1924.—The author investigated the time factor for death when different supramaximal temperatures act on certain plant cells. He employed as experimental material *Draparnaldia*; leaf cells of *Elodea*, *Tradescantia*, and *Brassica*; also roots of *Pisum* and *Beta*. As criteria of the death of the cells, there were used, in part, the capacity of the cells to exhibit plasmolysis and deplasmolysis, in part their impermeability for sulphonic dyes, and in part also their capacity for further development. When the temperature increases in arithmetical progression the time factor of death diminishes almost in geometrical ratio. With a temperature rise of 10°C. the time factor for death is 26–118 times shorter. The temperature coefficient of the thermal death point is many times greater than the temperature coefficient of ordinary chemical reactions. It is, however, of

the same order of magnitude as the temperature coefficient of denaturizing proteins by heat. This result supports the assumption that thermal death in the cases investigated is effected by a thermal denaturing of the proteins of the protoplasm.—*Author's abstract.*

RADIANT ENERGY RELATIONS

3889. ADAMS, J. **Duration of light and growth.** *Ann. Bot.* 38: 485-508. 1924.—Sixteen different species of plants were used in the experiments. The period of exposure to natural daylight was 0, 3, 5, 6, 10, 12, and 15 hours daily. In other cases electrical illumination was used to bring the total period of exposure up to 18 and 20 hours. The greater the exposure to natural daylight in general, the greater was the ultimate height reached, though with the shorter exposures the plants grew more rapidly at first. It is inferred that the rate of growth whether in light or darkness depends on the amount of reserve material available, and that plants in diminished light grow more rapidly while the reserve lasts. The effect of artificial illumination varied with the species and with the amount of natural light. When the period of daylight was from 9 to 12 hours, the addition of artificial illumination in most cases had a beneficial effect, promoting the rate of growth and hastening the time of flowering. When the period of daylight was more than 12 hours, the addition of artificial illumination had a beneficial effect in some cases (for example, spring wheat), but in general the effect was small or absent. The soybean did not flower at all, and with hemp there was a retarding effect on both height and weight.—*W. P. Thompson.*

3890. BECKING, L. B., AND M. I. GREGERSEN. **The effect of light on the permeability of lecithin.** *Proc. Soc. Exp. Biol. and Med.* 22: 130-133. 1924.—Light changes the permeability of plant protoplasm. The universal distribution of lipoids in plant protoplasm justified the authors' choice of lecithin as a material for permeability studies. Membranes of lecithin-collodion placed in a diffusing solution (0.02 M KCl) showed that on illumination there was an increase in conductivity followed by a more or less pronounced decrease, after which the diffusion assumed its original rate.—*M. M. Brooks.*

3891. CROWTHER, J. A. **Some considerations relative to the action of X-rays on tissue cells.** *Proc. Roy. Soc. London B* 96: 207-211. 1924.

3892. HESS, ALFRED F., AND MILDRED WEINSTOCK. **Antirachitic properties imparted to lettuce and to growing wheat by ultraviolet irradiation.** *Proc. Soc. Exp. Biol. & Med.* 22: 5-6. 1924.—Wheat and green lettuce when irradiated with a mercury vapor lamp formed an antirachitic substance —*M. M. Brooks.*

3893. HESS, ALFRED F., AND MILDRED WEINSTOCK. **Antirachitic properties imparted to inert fluids by ultraviolet irradiation.** *Proc. Soc. Exp. Biol. and Med.* 22: 6-7. 1924.—Cotton seed and linseed oils when irradiated were able to protect rats from rickets. These oils were also able to store this factor for a considerable time.—*M. M. Brooks.*

3894. KAYSER, E., ET H. DELAVAL. **Radioactivité et fixateurs d'azote. [Radioactivity and the fixation of nitrogen.]** *Compt. Rend. Acad. Sci. Paris* 179: 110-112. 1924.—This is a study confirming the work of Stoklasa on a favorable influence of radioactive emanations. Three species of *Azotobacter* were employed. Controls were studied in comparison with results from organisms grown in the presence of a mineral containing radium and uranium oxide added to a mannite medium in the proportion of 0.015 and 0.030 gm. per l. *Azotobacter* "de la Comore" displayed an increase in nitrogen fixation of 250% in the former and 506% in the latter solution. *Azotobacter chroococcum* showed 67% and 78% respectively. *Azotobacter agile* showed the least, 35% and 56% respectively.—*C. H. Farr.*

3895. LELIEVELD, G. VAN. **Invloed van het licht op de kieming der boomzaden. [Influence of light upon germination of tree seed.]** *Landbouwk. Tijdschr.* 36: 255-265. 1924.—The influence of light upon germinating seed of *Pinus* is clearly observed, although the relation to light is not obligate. Of each quantity of seed placed to germinate in darkness, a certain number remained dormant, a smaller number remained dormant among those exposed to the light. Those seed not germinating in darkness, which were nevertheless healthy, germinated under the influence of diffuse illumination. Direct sunlight is disadvantageous to germination.—*J. C. Th. Uphof.*

3896. TINCKER, M. A. H. Effect of length of day on flowering and growth. *Nature* 114: 350-351. 2 figs. 1924.—This is a preliminary report of experiments at the Welsh Plant Breeding Station. Daylight periods of 6, 9 and 12 hours were used and the different plants showed 3 types of behavior: (1) Ever-blooming; *Poa annua* flowered normally under all periods. (2) Short day; *Chrysanthemum* (Mrs. William Buckingham) treated since May 9 produced flowers on short day plants in early August, no buds on controls; *Phaseolus vulgaris* (Runner Bean, Sutton's Best of All) flowered 4 days earlier on treated plants, which were much dwarfed. (3) Long day plants; red clover (3 strains), oats (4 strains), radish (1 strain), foxglove, and several common grasses. The short day red clovers (illustrated) remained prostrate or nearly so.—O. A. Stevens.

TOXIC AGENTS

3897. BODINE, JOSEPH HALL. Some physiological actions of cyanides. *Jour. Gen. Phys.* 7: 19-23. 1924.—The author studied the effect of dilute solution of cyanides upon protozoans, tadpoles, and "artificial cells." He found that "the physiological actions of HCN and its salts appear to be due (1) to the ease with which HCN molecules penetrate living cells and then ionizing, exert their influence by means of H ions and CN ions; (2) to the weakness of HCN as an acid, which at neutrality or even at slight alkalinity permits the presence of a considerable amount of free HCN molecules in the presence of their salts; (3) to specific effects occasioned by its chemical activity. The order of resistance of various protozoans to HCN resembles that of the same protozoa to CO₂ and H₂S, but is the reverse of their resistance to mineral acids." HCN penetrates the cell rapidly, also acting specifically on certain species of protozoa.—O. L. Inman.

MISCELLANEOUS

3898. ANDRISKA, VIKTOR. Bestimmung des Kohlenoxydgehaltes der Luft. [Determination of CO₂ content of air.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 46: 43-46. 1923.

TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

(See also in this issue Entries 3229, 3302, 3310, 3317, 3319, 3320, 3326, 3361, 3380, 3440, 3538, 3552, 3677, 3731)

GENERAL

3899. BLAKE, SIDNEY FAY. *Polygalaceae*. *North Amer. Flora* [New York] 25: 305-379. 1924.—A taxonomic treatment of the family in North America is given. Three genera are recognized: *Polygala* (179 species), *Elsota* (8 species), *Monnina* (11 species). The following new species and new combinations occur: *Polygala piliophora*, *P. annectens*, *P. Russelliana*, *P. miamiensis* Small, *P. longiloba*, *P. perennis*, *P. rhysocarpa*, *P. caeruleascens*, *P. grandiflora* Walt. var. *leiodes*, *Elsota Micheliana* (*Securidaca Micheliana* Chod.), *E. elliptica* (*Securidaca elliptica* Turcz.), *E. diversifolia* (*Polygala diversifolia* L.), *E. coriacea* (*Securidaca coriacea* Bonpl.), *Monnina latiseptala*, and *M. crispata*.—E. B. Payson.

3900. GLEASON, HENRY ALLEN. *Dichapetalaceae*. *North Amer. Flora* [New York] 25: 381-383. 1924.—A taxonomic treatment of this family for North America is given. Two genera, *Symphyllanthus* (1 species) and *Tapura* (3 species), are described. The following new species and new combination occur: *Symphyllanthus Donnell-Smithii* (*Dichapetalum Donnell-Smithii* Engler), *Tapura antillana*.—E. B. Payson.

3901. RYDBERG, PER AXEL. *Fabaceae. Galegeae* (pars). *North Amer. Flora* [New York] 24: 201-250. 1924.—In continuation of his study of the Leguminosae, the author here presents another part of the taxonomic treatment of the tribe *Galegeae*. The following new species and new combinations occur: *Sesban exasperatus* (*Sesbania exasperata* HBK.), *S.*

bispinosus (*Aeschynomene bispinosa* Jacq.), *S. exaltatus* (*Darwinia exaltata* Raf.), *S. sonorae*, *Daubentonia virgata* (*Aeschynomene virgata* Cav.), *Diphysa punctata*, *D. microphylla*, *D. spinosa*, *D. puberulenta*, *D. villosa*, *Notodon Roigii* Britton & Wilson (*Corynella gracilis* Griseb., not *Notodon gracilis* Urban), *Robinia luxurians* (*Robinia neomexicana* var. *luxurians* Dieck), *R. breviloba*, *R. subvelutina*, *Hesperothamnus Purpusi* (*Selerothamnus Purpusi* Harms), *H. pentaphyllus* (*Selerothamnus pentaphyllus* Harms), *H. brachycalyx*, *H. Ehrenbergii* (*Selerothamnus Ehrenbergii* Harms), *Gliricidia Ehrenbergii* (*Robinia Ehrenbergii* Schlecht.), *Benthamantha panamensis*, *B. microphylla*, *B. chiapensis*, *B. Brandegei*, *B. Wrightii*, *B. Painteri*, *B. trifoliolata*, *B. robusta*, *B. glabella* (*Cracca Edwardsii* var. *glabella* Gray).—E. B. Payson.

3902. SCHULZ, O. E. **Cruciferae-Sisymbrieae**. Pflanzenreich Heft 86 (IV. 105). P. 1-388. Fig. 1-74. 1924.—The author gives a preliminary survey of the most important literature, morphology, anatomy, pollination, fruit, seed, seedlings, geographical distribution, relationship and uses of the plants considered in this subdivision of the family. Six subtribes are recognized as follows: *Alliariinae*, *Sisymbriinae*, *Pachycladinae*, *Brayinae*, *Arabidopsidinae*, *Descurainiinae*. Dichotomous keys are provided for the delimitation of all subtribes, genera, sections and species. For every species is given a bibliography, synonyms, description and citation of specimens arranged to show geographical distribution. The subspecific treatment is limited mostly to a discussion of varieties and forms, when these occur. The following new genera and species as well as new specific combinations are made: *Eutrema lancifolium* (*Goldbackia lancifolia* Franchet), *E. deltoideum* (*Sisymbrium deltoideum* Hook. f. & Thoms.), *Sisymbrium*, *pachypodium* Schulz & Thellung (*Brassica pachypoda* Thellung), *S. versicolor* (*Thelypodium versicolor* Brandege), *S. Purpusii* (*Thelypodium Purpusii* Brandege), *S. intricatissimum* (*Hesperis intricatissima* O. Ktze.), *S. pubescens* (*S. andinum* Phil. var. *pubescens* Phil.), *S. adscendens*, *S. effusum*, *S. Orizabae* (*Nasturtium? Orizabae* Schlecht. & Cham.), *S. pandurifolium* O. Ktze. (*Hesperis pandurifolia* O. Ktze.), *S. oleraceum*, *S. Meyenii*, *S. brasiliense*, *S. dissitiflorum*, *S. Marlothii*, *S. Dinteri*, *S. glabratum* Stapf, *Coelophragmus* n. gen. *C. auriculatus* (*Sisymbrium auriculatum* A. Gray), *C. umbrosus* (*Sisymbrium umbrosus* Robinson), *Chaunanthus*, n. gen., *C. petiolatus* (*Thelypodium petiolatum* Hemsl.), *Microsisymbrium*, n. gen., *M. axillare* (*Sisymbrium axillare* Hook. f. & Thoms.), *M. minutiflorum* (*Sisymbrium minutiflorum* Hook. f. & Thoms.), *M. Griffithianum* (*Sisymbrium Griffithianum* Boiss.), *M. lasiophyllum* (*Turritis? lasiophyllum* Hook. & Arn.), *Lycocarpus* n. gen., *L. fugax* (*Sisymbrium fugax* Lag.), *Phlebiophragmus*, n. gen., *P. macrorrhizus* (*Thelypodium macrorrhizum* Muschler), *Mostacillastrum* n. gen., *M. elongatum*, *M. stenophyllum* (*Sisymbrium stenophyllum* Gillies), *M. Ameghinoi* (*Sisymbrium Ameghinoi* Speg.), *Ischnocarpus* n. gen., *I. Novae-Zelandiae* (*Sisymbrium Novae-Zelandiae* Hook. f.), *Phryne Boryi* (*Cardamine Boryi* Boiss.), *P. Zanonii* (*Erucastrum Zanonii* Ball), *P. Huettii* (*Cardamine Huettii* Boiss.), *Pterygiosperma* n. gen. *P. tehuelches* (*Sisymbrium tehuelches* Speg.), *Neuontobotrys* n. gen., *N. linifolius* (*Sisymbrium linifolium* Phil.), *Polypsecadium* n. gen., *P. Harmsianum* (*Thelypodium Harmsianum* Muschler), *Arabidella* n. gen., *A. trisecta* (*Erysimum trisectum* F. v. Mueller), *Chilocardamum* n. gen., *C. patagonicum* (*Sisymbrium patagonicum* Speg.), *Arcyosperma* n. gen., *A. primulifolium* (*Sisymbrium primulifolium* Thoms.), *Oreophyton* n. gen., *O. falcata* (Braya falcata Hochst.), *Dielsiocharis* n. gen., *D. Kotschyi* (*Alyssopsis Kotschyi* Boiss.), *Stenodraba* n. gen., *S. parvifolia* (*Sisymbrium parvifolium* Phil.) *S. andina* (*Draba andina* Phil.), *S. chillanensis* (*Draba chillanensis* Phil.), *S. stenophylla* (*Draba stenophylla* Leybold), *S. imbricatifolia* (*Draba imbricatifolia* Barn.), *S. suffruticosa* (*Draba suffruticosa* Barn.), *Alpaminia* n. gen., *A. trichocarpa* (*Eudema trichocarpa* Muschler), *Pelagatia* n. gen., *P. bracteata*, *Weberbaueria spathulifolia* (*Sisymbrium spathulaefolium* A. Gray), *W. pusilla* (*Erysimum? pusillum* Gillies), *Aphragmus involucratum* (*Platypetalum involucratum* Bunge), *Pycnoplithus* n. gen., *P. uniflora* (*Braya uniflora* Hook. f. & Thoms.), *Onuris papillosa*, *Sarcodraba subterranea* (*Draba karr-aikensis* Speg. var. *subterranea* Speg. in herb.), *Maresia pygmaea* (*Hesperis pygmaea* Del.), *M. pulchella* (*Hesperis pulchella* DC.), *Torularia* n. gen., *T. torulosa* (*Sisymbrium torulosum* Desf.), *T. rossica*, *T. mollipila* (*Sisymbrium mollipilum* Maxim.), *T. contortuplicata* (*Cheiranthus contortuplicatus* Steph.), *T. Korolkowii* (*Sisymbrium Korolkowii* Regel & Schmalh.), *T. sulphurea* (*Sisymbrium sulphureum* Korsh.), *T. sumbarensis* (*Sisymbrium sumbarensense* Lipsky),

T. adpressa (*Sisymbrium adpressum* Trautv.), *T. tetracmoides* (*Sisymbrium tetracmoides* Boiss. & Hausskn.), *T. brevipes* (*Sisymbrium brevipes* Kar. & Kir.), *T. aculeolata* (*Sisymbrium aculeolatum* Boiss.), *Brayopsis monimocalyx* (*Braya monimocalyx* Gilg & Muschler) *Eudema Remyana* (*Sisymbrium Remyanum* Weddell), *E. Friesii*, *E. diapiensoides* (*Draba diapiensoides* Weddell), *E. colobanthoides* Skottsberg, *Thellungiella* n. gen., *T. salsuginea* (*Sisymbrium salsugineum* Pallas), *T. halophila* (*Sisymbrium halophilum* C. A. Mey.), *Pseudarabidella* n. gen., *P. filifolia* (*Erysimum filifolium* F. v. Mueller), *Drabastrum* n. gen., *D. alpestre* (*Blennodia alpestris* F. v. Mueller), *Scambopus* n. gen., *S. curvipes* (*Erysimum curvipes* F. v. Mueller), *S. Richardsii* (*Erysimum Richardsii* F. v. Mueller), *Harmsiodoxa* n. gen., *H. blennodioides* (*Erysimum blennodioides* F. v. Mueller), *H. Cunninghamii* (*Blennodia Cunninghamii* Benth.), *H. brevipes* (*Erysimum brevipes* F. v. Mueller), *Micromystria* n. gen., *M. nasturtium* (*Erysimum nasturtium* F. v. Mueller), *M. eremigena* (*Sisymbrium eremigenum* F. v. Mueller), *Pachymitus* n. gen., *P. cardaminoides* (*Sisymbrium cardaminoides* F. v. Mueller), *P. Lucae* (*Erysimum Lucae* F. v. Mueller), *Lemphoria* n. gen., *L. procumbens* (*Sisymbrium procumbens* Tate), *Arabidopsis parvula* (*Diplotaxis?* *parvula* Schrenk), *A. Kneuckeri* (*Sisymbrium Kneuckeri* Bornm.), *A. mollissima* (*Sisymbrium mollissimum* C. A. Mey.), *A. lasiocarpa* (*Sisymbrium lasiocarpum* Hook. f. & Thoms.), *A. monachorum* (*Sisymbrium monachorum* W. W. Smith), *A. himalaica* (*Arabis himalaica* Edgew.), *Halimolobus lasiolobus* (*Arabis lasioloba* Link), *H. diffusus* (*Sisymbrium diffusum* A. Gray), *H. Berlandieri* (*Sisymbrium Berlandieri* Fourn.), *H. virgatus* (*Sisymbrium virgatum* Nutt.), *H. Palmeri* (*Sisymbrium Palmeri* Hemsl.), *H. acutifolius*, *H. hispidulus* (*Turritis hispidula* DC.), *H. Weddellii* (*Sisymbrium Weddellii* Fourn.), *H. montanus* (*Greggia montana* Griseb.), *H. adpressus*, *H. polyspermus* (*Sisymbrium polyspermum* Fourn.), *Heterothrix patens*, *H. gracilis* (*Sisymbrium gracile* Wedd.), *H. juncea*, *H. petraea* (*Sisymbrium petraeum* Phil.), *H. anethifolia* (*Nasturtium anethifolium* Phil.), *Lamprophragma* n. gen., *L. longifolium* (*Streptanthus longifolius* Benth.), *Cymatocarpus* n. gen., *C. pilosissimus* (*Sisymbrium pilosissimum* Trautv.), *Descurainia Kochii* (*Sisymbrium Kochii* Petri), *D. Sophioides* (*Sisymbrium Sophioides* Fischer), *D. streptocarpa* (*Sisymbrium streptocarpum* Fourn.), *D. serrata* (*Sophia serrata* Greene), *D. impatiens* (*Nasturtium impatiens* Cham. & Schlecht.), *D. Richardsonii* (*Sisymbrium Richardsonii* Sweet), *D. Rydbergii* (*Sophia glandulifera* Rydb.), *D. obtusa* (*Sophia obtusa* Greene), *D. Virletii* (*Sisymbrium Virletii* Fourn.), *D. Nuttallii* (*Sisymbrium Nuttallii* Colla), *D. diversifolia*, *D. longipedicellata* (*Sisymbrium longepedicellatum* Fourn.), *D. brachycarpa* (*Sisymbrium brachycarpum* Richards.), *D. multifida* (*Cardamine multifida* Pursh), *D. Menziesii* (*Cardamine?* *Menziesii* DC.), *D. halictorum* (*Sophia halictorum* Ckll.), *D. californica* (*Smelowskia?* *californica* A. Gray), *D. paradisae* (*Sophia paradisae* Nelson & Kennedy), *D. argentina*, *D. appendiculata* (*Sisymbrium canescens* Nutt. var. *appendiculatum* Griseb.), *D. argentea*, *D. pimpinellifolia* (*Sisymbrium pimpinellaefolium* Barn.), *D. antarctica* (*Sisymbrium antarcticum* Fourn.), *D. latisiliqua* (*D. myriophylla* Fries var. *latisiliqua* Muschler), *D. athrocarpa* (*Sisymbrium athrocarpum* Gray), *Sophiopsis* n. gen., *S. sisymbrioides* (*Hutchinsia sisymbrioides* Regel & Herder), *S. annua* (*Smelowskia annua* Ruprecht), *S. flavissima* (*Sisymbrium flavissimum* Kar. & Kir.), *Hugueninia balearica* (*Sisymbrium balearicum* Porta), *Robeschia Schimper* (*Sisymbrium Schimper* Boiss.), *Eremodraaba*, n. gen., *E. intricatissima* (*Draba intricatissima* Phil.).—*E. B. Payson.*

3903. SMALL, JOHN KUNKEL. Polygalales. North Amer. Flora [New York] 25: 299. 1924.—This order is characterized and a key is provided for the 3 recognized families in North America: *Vochyaceae*, *Polygalaceae* and *Dichapetalaceae*.—*E. B. Payson.*

3904. STANDLEY, PAUL CARPENTER. Trigoniaceae. North Amer. Flora [New York] 25: 297-298. 1924.—A systematic treatment of species of this family known to occur in North America is given. One genus, *Trigonia*, is recognized with 2 species. *Trigonia euryphylla* is described as new.—*E. B. Payson.*

3905. STANDLEY, PAUL CARPENTER. Vochyaceae. North Amer. Flora [New York] 25: 301-303. 1924.—A taxonomic treatment is presented of the single genus and 4 species that are held to represent this family in North America. Attention is called to the fact that the original spelling was *Vochya* but has been commonly written *Vochysia* by subsequent authors. The following new combinations occur: *Vochya ferruginea* (*Vochisia ferruginea* Mart.), *V. guatemalensis* (*Vochisia guatemalensis* Donn. Smith), *V. tabascana* (*Vochisia tabascana* Sprague), and *V. hondurensis* (*Vochisia hondurensis* Sprague).—*E. B. Payson.*

3906. TAVARES, J. S. O herbário do Collégio de S. Fiel. [The herbarium of St. Fiel College.] *Broteria Sér. Bot.* 21: 82-87. 1924.—The herbarium of the Collégio de S. Fiel, now non-existent, was begun in 1897 by C. Zimmermann, and continued until 1910, when it was transferred to the University of Coimbra, Portugal, on account of the closing of the former University and the dispersal of the staff. The article also outlines the extent of the collections and the main work of those scientists who composed the staff.—*E. B. Chamberlain.*

3907. WALCOTT, C. D. Report of the Secretary. *Ann. Rept. Smithsonian Inst.* 1922: 1-125. 1924.—Botanical activities mentioned under the head of researches and explorations are the trip of A. S. Hitchcock to the Orient, and a biological expedition to the Dominican Republic on which 4000 plants were collected. Proposal is made for a flora of the Philippines on which the work has not yet been started. Projects of the National Museum were a 5-months trip to El Salvador and Guatemala by P. C. Standley, on which 6000 specimens were collected. F. W. Pennell and E. P. Killip collected in western Colombia, the trip being one of a series leading toward a complete floristic study of northern South America. Acquisitions to collections include the Buchtien Herbarium of 45,000 specimens from western South America. Important additions were also made to the collections of textiles, wood technology, etc.—*Neil Hotchkiss.*

3908. WILSON, PERCY. *Meliaceae*. *North Amer. Flora* [New York] 254: 263-293. 1924.—The author gives a taxonomic treatment of the genera and species of this family that are known to occur in North America. Generic and specific keys and diagnoses are given in conformity with the general plan of the North American Flora. Seven genera are recognized as constituting the family. These are: *Melia* (1 species), *Cabralea* (1 species), *Guarea* (33 species), *Trichilia* (33 species), *Carapa* (3 species), *Swietenia* (4 species), *Cedrela* (13 species).—The following new names and new combinations occur: *Guarea glabrescens* (*Sapindus glabrescens* H. & A.), *G. Guara* (*Melia Guara* Jacq.), *Trichilia aquifolia* (*Ilex cuneifolia* L., not Pulle), *T. reticulata* (*T. polyneura* Urban, not C. DC.).—*E. B. Payson.*

PTERIDOPHYTES

3909. L., L. Les Filicinées du Quebec. [The ferns of Quebec.] *Nat. Canadien* 50: 243-244. 1924.—A review is given of FR. MARIE-VICTORIN'S "Les Filicinées du Quebec," taken from the "Bulletin de la Société de France, Tome 70, 1923."—*A. H. MacKay.*

SPERMATOPHYTES

3910. BENOIST, R. Descriptions d'espèces nouvelles de Phanérogames de la Guyane française. [New species of Phanerogams from French Guiana.] *Bull. Mus. Hist. Nat.* [Paris] 30: 103-105. 1924.—The author describes 3 new species of Moraceae; *Coussapoa Leprieurii*, *Pourouma minor*, *Ficus anguina*; and 1 new species of Myristicaceae: *Myristica Melinonii*.—*John M. Fogg, Jr.*

3911. BLAKE, S. F. *Hemibaccharis*, a new genus of Baccharidinae. *Contrib. U. S. Nation. Herb.* 20: 543-554. *Pl.* 48-51. 1924.—The new genus *Hemibaccharis*, intermediate between *Baccharis* and *Eschenbachia* (*Conyza*) is described, and a key is given to the 15 species recognized, followed by a list of the species with synonymy, list of specimens examined, and remarks on the diagnostic characters. The paper ends with a list of doubtful species. New names: *Hemibaccharis* (n. gen. of *Baccharidinae*), *H. glandulosa* (*Baccharis glandulosa* Greenm.), *H. oaxacana* (*B. oaxacana* Greenm.), *H. Pringlei* (*B. Pringlei* Greenm.), *H. hieracioides* (*Baccharis hieraciifolia* Hemsl., not Lam.), *H. simplex* (Mexico), *H. salmeoides* (Guatemala), *H. hirtella* (*B. hirtella* DC.), *H. flexilis* (Guatemala), *H. torquis* (Mexico to Costa Rica), *H. mucronata* (*B. mucronata* HBK.), *H. mucronata paniculata* (*Diplostephium paniculatum* Donn. Smith), *H. irazuensis* (Costa Rica), *H. sescenticeps* (Mexico), *H. androgyna* (*Baccharis androgyna* T. S. Brandeg.), *H. asperifolia* (*B. asperifolia* Benth.) and *H. corymbosa* (*Diplostephium corymbosum* Donn. Smith). Four species are illustrated.—*S. F. Blake.*

3912. BLAKE, S. F. New American Asteraceae. *Contrib. U. S. Nation. Herb.* 22: 587-661. *Pl.* 54-63, fig. 87. 1924.—In this paper 118 species and 1 new genus of American Asteraceae are described, chiefly from Mexico, Central and South America. New names are:

Vernonia durangensis (*Eremosis ovata* Gleason, not *V. ovata* Less.), *V. stellata* (*Conyza stellata* Spreng.), *Jaliscoa pappifera* (Mexico), *Ageratum elassocarpum* (Mexico), *A. salicifolium* (Mexico), *annectens* (Mexico), *Stevia flourensioides* (Mexico), *S. integra* (Mexico), *S. pelophila* (Mexico), *S. tephrophylla* (Mexico), *Fleischmannia Standleyi* (Mexico), *Kuhnia triplinervis* (Mexico), *Gutierrezia digyna* (Mexico), *G. dracunculoides* (*Brachyris dracunculoides* DC.), *G. grandis* (Mexico), *Laestadia costaricensis* (Costa Rica), *Bellis Garciae* (Mexico), *B. mima* (Mexico), *Erigeron Mazonii* (Panama), *Baccharis alamosana* (Mexico), *B. occidentalis* (Mexico), *Achyrocline crassiceps* (Colombia), *Nocca media* (Mexico), *N. pteropoda* (Mexico), *Clibadium propinquum* (*Wulfia Sodiroi* Hieron., not *C. Sodiroi* Hieron.), *C. pentaneuron* (Colombia), *C. parviceps* (Venezuela), *C. grandifolium* (Costa Rica), *C. caudatum* (Panama), *C. appressipilum* (Panama), *C. grande* (Costa Rica), *C. pueblanum* (Mexico), *C. Schulzii* (Costa Rica), *C. sychnocephalum* (Colombia), *Espeletia argentea phaneractis* (Colombia), *Polymnia apus* (Mexico), *P. parviceps* (Peru), *Guardiola tulocarpus pubescens* (Mexico), *Melampodium cinerascens* (Mexico), *M. argophyllum* (*M. cinereum* var. *argophyllum* A. Gray), *M. microcarpum* (Mexico), *Parthenium densipilum* (Mexico), *P. parviceps* (Mexico), *Zinnia leucoglossa* (Mexico), *Heliotropis longipes* (*Philactis longipes* A. Gray), *Rumfordia verapazensis* (Guatemala), *Sclerocarpus columbianus* Rusby & Blake (Colombia), *Montanoa Rekoii* (Mexico), *M. subglabra* (Mexico), *M. Arsenei* (Mexico), *M. pilosipalea* (Mexico), *M. affinis* (Mexico), *Isocarpha cubana* (Cuba), *I. glabrata* (Cuba), *Sabazia leiachaenia* (Mexico), *S. radicans* (Mexico), *S. triangularis* (Panama), *Wedelia oxylepis* (Ecuador), *Aspilia macrolepis* (Colombia), *A. patentipilis* (Colombia), *A. retroflexa* (Ecuador), *A. angusta* (*A. angustifolia* A. Gray, not Oliver & Hiern), *A. linearis* (*A. linearifolia* Baker, not Oliver & Hiern), *A. Jelskii* (Hieron.), *A. lanceolata* (*Gymnolomia hirsuta* Klatt, not *A. hirsuta* (Gardn.) Benth. & Hook.), *A. tenella* (*Gymnolomia tenella* HBK.), *A. triplinervia* (*G. triplinervia* HBK.), *Viguiera apiculata* (Mexico), *Helianthus grandiceps* (Ecuador), *H. subniveus* (*H. niveus* Hieron., not T. S. Brandeg.), *Perymenium simulans* (Mexico), *P. subcordatum* (Mexico), *P. oxycarpum* (Mexico), *P. lancifolium* (Mexico), *P. rotundisquamum* (Mexico), *P. nicaraguense* (Nicaragua), *P. chihuahuense* (Mexico), *P. lasiolepis* (Mexico), *P. consobrinum* (Mexico), *P. latisquamum* (Mexico), *P. acuminatum* (*Oleiza acuminata* Llave), *Steiractinia Rusbyana* (Colombia), *S. longipes* (Colombia), *Mel-anthera oxycarpa* (Mexico), *M. purpurascens* (Mexico), *Flourensia hirtissima* (Argentina), *Simsia sanguinea albida* (Guatemala), *Hymenostephium rudbeckioides* (*Gymnolomia rudbeckioides* HBK.), *Zezemia media* (Mexico), *Z. michoacana* (Mexico), *Z. rotundata* (Mexico), *Z. gradata* (Mexico), *Z. cordifolia* (Mexico), *Z. aggregata* (Mexico), *Z. macropoda* (Guatemala), *Z. subsericea* (Guatemala), *Z. oyedaeoides* (Colombia), *Otopappus scaber* (Mexico), *Verbesina oxylepis* (Mexico), *V. synotis* (Mexico), *V. otophylla* (Mexico), *V. cymbipalea* (Mexico), *V. synethes* (Colombia), *V. laevis* (Peru), *V. crassiramea* (Colombia), *V. Pennellii* (Colombia), *V. baccharidea* (Colombia), *Coreopsis Buchii* (*Selleophytum Buchii* Urban), *C. oblanceolata* (Peru), *C. longula* (Peru), *C. triloba* (Ecuador), *C. Townsendii* (Peru), *C. boliviana* (Bolivia), *Calea Pennellii* (Colombia), *C. ovalis* (Colombia), *C. sororia* (Guatemala), *C. leptocephala* (Mexico), *C. Tejadae* (Guatemala), *C. brevipes* (Colombia), *C. pachyphylla* (*Aspilia pachyphylla* Klatt), *Tridax oligodonta* (Ecuador), *Trichocoryne* (n. gen. of *Helenieae*), *T. connata* (Mexico), *Hecubaea aptera* (Mexico), *Dyssodia Wootoni* (Mexico), *Tagetes crassiceps* (Ecuador), *Werneria articulata* (*W. Lehmannii* Hieron., not Klatt), *W. denticulata* (*W. brachypappus* Phil., not *W. brachypappa* Sch. Bip.), *Gochnatia boliviana* (Bolivia), *G. obtusata* (Mexico), *G. viscosissima* (*G. glutinosa* α *viscosissima* Kuntze), *Lycoseris trinervis* (*Diazeuxis trinervis* D. Don), *Proustia cuneata* (Peru), *Perezia Wislizeni minor* (Mexico), *Trixis peninsularis* (Lower California), *T. adenolepis* (Guatemala), *T. grandis* (Brazil), *T. verbascifolia* (*Bowmannia verbascifolia* Gardn.), *Pinaropappus parvus* (New Mexico), *Malacothrix floccifera* (*Senecio flocciferus* DC.) *Hieracium Arsenei* (Mexico), *H. Nicolasi* (Mexico), *H. jaliscopolum* (Mexico), *H. abscissum morelosanum* (Mexico), *H. panamense* (Panama), *H. melanochryseum* (Mexico), *H. comaticeps* (Mexico), *H. Mazonii* (Panama), *H. Herrerae* (Mexico). Ten of the new species are illustrated by photographs.—*S. F. Blake*.

3913. BLAKE, S. F. New plants from Venezuela. Contrib. U. S. Nation. Herb. 20: 519-541. Pl. 38-47. 1924.—This paper contains descriptions of 35 new plants collected in Venezuela by Henry Pittier and Alfredo Jahn. The new species and new combinations are *Erpodium latifolium* R. S. Williams, *Lacistema Pittieri*, *Cerastium cephalanthum*, *Arenaria*

Jahnii, *Drymaria paramorum*, *Draba chionophila*, *Bauhinia caudigera*. *Chaetocalyx retusa*, *Stylosanthes sericeiceps*, *Pterocarpus podocarpus*, *Platymiscium diadelphum*, *Coumarouna punctata*, *Geranium sebosum*, *Polygala retifera*, *P. stenocarpa*, *Vaccinium leiandrum*, *Thibaudia Jahnii*, *Forsteronia elachista*, *Prestonia brachypoda*, *Fischeria subaequalis*, *Vincetoxicum lasiostomum* (*Gonolobus lasiostomus* Decaisne), *Alseis leiantha*, *Chomelia polyantha*, *Evea lucentifolia*, *Oliganthes hypochlora*, *Ageratum sordidum*, *Podocoma bartisaefolia*, *Achyrocline flavida*, *Riencourtia ovata*, *Espeletia marcescens*, *E. occulta*, *Hymenostephium meridense*, *Otopappus australis*, *Oyedaea Jahnii*, *Verbesina laevifolia*, *Calea Lindenii* (*Allocaarpus Lindenii* Sch. Bip.), *Chaptalia meridensis*. Ten of the new species are illustrated.—*S. F. Blake*.

3914. CAMUS, AIMÉE. Contribution à la connaissance de quelques Graminées. [Contribution to our knowledge of certain Gramineae.] Bull. Mus. Hist. Nat. [Paris] 30: 106-108. 1924.—This article contains notes of a critical, nomenclatorial, and distributional character on the following grasses: *Digitaria longifolia* Pers. and *D. chinensis* Camus, both from E. Asia and Oceanica; *D. Fiebrigii* (*Panicum Fiebrigii* Hackel), Paraguay; *D. argillacea* (*Syntherisma argillacea* Hitch. & Chase), Porto Rica and Cuba; *D. curvinervis* (*Panicum curvinerve* Hackel), Cuba; *D. distans* (*Syntherisma distans* Chase), Mexico; *D. Simpsoni* (*Panicum sanguinale* var. *Simpsoni* Vasey), Cuba; *D. badia* (*Syntherisma badia* Chase), Mexico; *D. leucocoma* (*S. leucocoma* Nash), U. S. Gulf States, Mexico, and Cuba; *D. atrofusca* (*Panicum atrofusum* Hackl.), Madagascar; *D. argyrostachya* (*P. argyrostachyum* Steud.), Java; *Setaria sulcata* (*Panicum sulcatum* Aubl.), Mexico and the Antilles; and *S. impressa* (*P. impressum* Nees), Mexico, the Antilles, and Brazil.—*John M. Fogg, Jr.*

3915. CAMUS, AIMÉE. Le genre *Digastrum* A. Camus (Graminées). [The genus *Digastrum* A. Camus of the Gramineae.] Bull. Soc. Bot. France 70: 849-850. 1923.—This genus contains the 1 species, *D. fragile* A. Camus, which was *Ischaemum fragile* R. Br.—*P. A. Young*.

3916. CAMUS, AIMÉE. Le genre *Leptosaccharum* (Hackel) A. Camus. [The genus *Leptosaccharum*.] Bull. Soc. Bot. France 70: 736-738. 1923.—The author raises the subgenus *Leptosaccharum* Hackel to generic rank and refers thereto one species, namely, *L. filiforme* (*Saccharum filiforme* Hackel) from Paraguay and Brazil.—*P. A. Young*.

3917. CAMUS, MILE. A. Note sur le x *Cephalanthera* Schulzei G. Camus, Bergon et A. Camus. Bull. Soc. Bot. France 70: 451-453. Fig. 1. 1923.

3918. CHERMEZON, H. *Scleria* et *Schoenoxiphium* nouveaux de Madagascar. [New species of *Scleria* and *Schoenoxiphium* from Madagascar.] Bull. Soc. Bot. France 70: 297-301. 1923.—The author describes the following new species and variety: *Scleria andringitrensis*, *S. rosea*, *S. Perrieri*, *S. abortiva* Kunth var. *planifolia*, *Schoenoxiphium madagascariense*, and *S. gracile*. He says that *Scleria Baroni* C. B. Clarke is a nomen nudum and gives a description for it.—*P. A. Young*.

3919. CHERMEZON, H. Sur quelques *Carex* nouveaux de Madagascar. [New species of *Carex* from Madagascar.] Bull. Soc. Bot. France 70: 409-415. 1923.—The author described the following new species of *Carex*: *C. graminifolia*, *C. scabripes*, *C. andringitrensis*, *C. proxima*, *C. euryphylla*, *C. manongarivensis*, *C. sambiranensis*, *C. heterodoxa*, *C. hovarum*, *C. masoalensis*, and *C. penduliformis*; also the 2 new varieties, *C. Rutenbergiana* var. *glomerata*, and *C. Renchiana* var. *laxissima*.—*P. A. Young*.

3920. DOP, PAUL. Remarques sur les Loganiacées. [Remarks on the Loganiaceae.] Bull. Soc. Bot. France 70: 136-139. 1923.—The author gives a general discussion of this heterogenous family.—*P. A. Young*.

3921. FERNALD, M. L. I. *Polystichum mohrioides* and some other subantarctic or Andean plants in the northern hemisphere. II. The dwarf *Antennarias* of northeastern America. III. The eastern American representatives of *Arnica alpina*. IV. Some *Senecios* of eastern Quebec and Newfoundland. V. New or restudied plants of eastern America. Contrib. Gray Herb. N. S. 72: 89-107; 113-127. Pl. 142-144. 1924.—These papers are reprinted from *Rhodora* 26: 89-107; 113-127. Pl. 142-144. 1924.—*E. B. Payson*.

3922. FERNALD, M. L. The gentian of the tidal shores of the St. Lawrence. Nat. Canad. 50: 121-127. 5 fig. 1923.—A new species of gentian (*Gentiana Victorinii*) is described from the tidal shores of the River St. Lawrence from above the City of Quebec to L'Islet and is compared with *G. crinita* Froel., *G. procera* Holm, *G. Macounti* Holm and *G. nesophila* Holm.—*A. H. MacKay*.

3923. FORBES, HENRY O. Is *Orchis Fuchsii* (Druce) a valid species of Orchidaceae? *Nature* 114: 610-611. 1924.—This form is regarded as a minor form of *O. maculata* L.—O. A. Young.

3924. FOURNIER, P. Variétés nouvelles de la flore haut-marnaise. [New varieties of the upper Marne flora.] *Bull. Soc. Bot. France* 70: 31-34. 1923.—The author describes the following new varieties: *Anthyllis Dillenii* Schultes var. *croceiflora*, *Pirola rotundifolia* L. var. *chloranthoides* and *Poa trivialis* L. var. *agrostoides*.—P. A. Young.

3925. FOURNIER, P. *Vinca minor* L. var. *nummulariaefolia* P. Fournier. *Bull. Soc. Bot. France* 70: 284-285. 4 fig. 1923.

3926. GAGNEPAIN, F. Euphorbiacées nouvelles (*Antidesma*). [New Euphorbiaceae of the genus *Antidesma*.] *Bull. Soc. Bot. France* 70: 117-125. 1923.—The author describes the following new species of *Antidesma* from China: *A. annamense*, *A. cambodianum*, *A. Chonmorani*, *A. cochinchinense*, *A. Eberhardtii*, *A. Fleuryi*, *A. Poilanei*, *A. Rec.*, *A. subbicolor*, *A. Thorelii*, *A. anamense*, and *A. tonkinense*.—P. A. Young.

3927. GAGNEPAIN, F. Euphorbiacées nouvelles (*Aporosa* et *Baccaurea*). [New species of Euphorbiaceae in the genera *Aporosa* and *Baccaurea*.] *Bull. Soc. Bot. France* 70: 232-236. 1923.—The author describes the following new species: *Aporosa aberrans*, *A. serrata*, *A. sphaerocarpa* and var. *cordata*, *Baccaurea annamensis*, and *B. Hermandii* from China.—P. A. Young.

3928. GAGNEPAIN, F. Euphorbiacées nouvelles (*Baccaurea*, *Bridelia*, *Godefroya*, *Hymenocardia*). [New Euphorbiaceae in the genera *Baccaurea*, *Bridelia*, *Godefroya*, and *Hymenocardia*.] *Bull. Soc. Bot. France* 70: 431-437. 1923.—The paper contains the descriptions by the author of the following from Indo-China: *Godefroya* n. gen., *G. rotundata*, *Baccaurea oxycarpa*, *Bridelia cambodiana*, *B. Harmandii*, *B. Pierrei*, *B. Poilanei*, and *Hymenocardia localitica*.—P. A. Young.

3929. GAGNEPAIN, F. Euphorbiacées nouvelles ou critiques (*Acalypha*, *Excoecaria*, *Gelonium*). [New or critical Euphorbiaceae.] *Bull. Soc. Bot. France* 70: 871-876. 1923.—The author describes the following new species from Indo-China: *Acalypha Eberhardtii*, *A. Delphyana*, *A. Hernandiana*, *A. heterostachya*, *A. siamensis*, *Excoecaria Poilanei*, and *Gelonium cicerospermum*.—P. A. Young.

3930. GAGNEPAIN, F. Qu'est-ce que le genre *Cleistanthus* Hook.?—*Paracleisthus*, g. n. d'Euphorbiacées. [What is the genus *Cleistanthus*? *Paracleisthus*, a new genus of the Euphorbiaceae.] *Bull. Soc. Bot. France* 70: 496-502. 1923.—The author discusses the position of the genus *Cleistanthus*, proposes the new genus *Paracleisthus*, lists the species which it contains, and describes the following new species and variety from Indo-China: *Paracleisthus Eberhardtii*, *P. Pierrei*, *P. subgracilis*, and *Cleistanthus eburneus* and its variety *sordidus*.—P. A. Young.

3931. GANDOGER, MICHEL. La famille des Strychnacées. [The family Strychnaceae.] *Bull. Soc. Bot. France* 70: 919-923. 1923.—The author discusses the position of the genus *Nuxia* and describes the following new species: *Fagraea Ridleyi*, *Spigelia domingensis*, and *Mitreola Tracyi*.—P. A. Young.

3932. GANDOGER, MICHEL. Les Byttneriacées de l'Afrique australe. [The Byttneriaceae of southern Africa.] *Bull. Soc. Bot. France* 70: 200-204. 1923.—The author says that the genus *Mahernia* contains more than 50 species all limited to the southern part of Africa. He gives a key to the 6 new species of *Mahernia* which he describes: *M. psilodes*, *M. Sonderiana*, *M. Macowani*, *M. caput felis*, *M. coronopifolia*, and *M. Ecklonis*. A bibliography of 33 titles is appended.—P. A. Young.

3933. GERBAULT, E. L. Précisions sur le *Viola nana* DC. [Notes on *V. nana*.] *Bull. Soc. Bot. France* 70: 453-455. 1923.—The author gives an addition to the description of this species.—P. A. Young.

3934. GUILLAUMIN, A. Espèces et localités nouvelles de Styracacées de l'Aise orientale (1). [New species and localities of Styracaceae in eastern Asia.] *Bull. Soc. Bot. France* 70: 882-886. 1923.—The author describes the following new species: *Styrax annamensis*, *S. bracteolata*, *S. rubifolia*, *Alniphyllum Eberhardtii*, and *Pterostyrax Cavaleriei*.—P. A. Young.

3935. ITO, TOKUTARO. De nova Asari specie ex Japonia australi. [New species of

Asarum from southern Japan.] Sci. Rept. Tohoku Imp. Univ. IV, 1: 45-49. Pl. 1. 1924.—*Asarum Fudsinoi* is described and illustrated as a new species from southern Japan.—J. M. Greenman.

3936. JEDWABNICK, ELISABETH. Neue Arten der Gattung *Eragrostis*. [New species of *Eragrostis*.] Bot. Archiv. 4: 327-328. 1923.—*Eragrostis Pilgeriana* (southwest Africa), *E. Basedowii* (South Australia), and *E. Moritzii* (Venezuela) are described.—William Seifriz.

3937. JOHNSTON, I. M. New plants of Portuguese West Africa collected by Mrs. Richard C. Curtis. Contrib. Gray Herb. N.S. 73: 31-40. Pl. 1-2. 1924.—The following new species are described: *Acrospira Curtisiae*, *Brachystegia Russelliae*, *Cryptosepalum Curtisiorum*, *Crotalaria bicolor*, *Indigofera latipinna*, *Aeschynomene Curtisiae*, *Dolichos linearifolius*, *Polygala congestiflora*, *Triumfetta glabrata*, *Ochna angolensis*, *Symphostemon articulatus*, *Ocimum cuanazeae*, *Thelypteris palustris* Schott var. *squamigera* Weatherby (*Aspidium Thelypteris* β *squamigerum* Schlecht.). Eight of the new species are illustrated.—E. B. Payson.

3938. JOHNSTON, I. M. On some South American Proteaceae. Contrib. Gray Herb. N. S. 73: 41-42. 1924.—The following new species and new combinations occur: *Euplassa occidentalis*, *E. bahiensis* (*Adenostephanus bahiensis* Meisn.), *E. incana* (*Adenostephanus incana* Klotzsch), *E. laxiflora* (*Adenostephanus laxiflora* Meisn.), *E. legalis* (*Dicneckeria legalis* Vell.), *E. nitida* (*Adenostephanus nitida* Meisn.), *E. organensis* (*Rhopala organensis* Gard.), *E. pinnata* (*Roupala pinnata* Lam.), and *Roupala monosperma* (*Embothrium monospermum* R. & P.).—E. B. Payson.

3939. JOHNSTON, I. M. Taxonomic records concerning American Spermatophytes. Contrib. Gray Herb. N. S. 70: 61-92. 1924.—(1) *Parkinsonia* and *Cercidium*. These 2 genera are maintained as distinct but the generic limits are changed slightly. *Parkinsonia* is found to contain 2 species, while *Cercidium* has 8. The following new species and new combinations are published: *Cercidium macrum*, *C. microphyllum* Rose & Johnston (*Parkinsonia microphylla* Torr.), *C. sonorae* Rose & Johnston and *C. australe*.—(2) New or otherwise noteworthy plants. The following new species and varieties are characterized and new combinations are made: *Persea Hartmannii*, *P. podadenia* Blake var. *glaberramea*, *Phoebe longipes*, *Misanteca costaricensis*, *Misanteca Peckii*, *Calliandra socorrensis*, *Piscidia acuminata* (*Ichthyomethia acuminata* Blake), *P. communis* (*I. communis* Blake), *P. grandifolia* (*Deris grandifolia* Donn. Sm.), *Fagonia cretica* var. *canariensis*, *Protium panamense* (*Icica panamensis* Rose), *Euphorbia Hinkleyorum*, *Malvastrum Hinkleyorum*, *M. arequipense*, *M. congestiflorum*, *M. Shephardae*, *M. catamarcense*, *M. Jorgensenii*, *Monnina ramosa*, *Oenothera verrucosa*, *Jarilla* (*Mocinna* La Llave, not *Mocinna* Lag.), *J. heterophylla* (*Mocinna heterophylla* La Llave), *Jacaratia costaricensis*, *Pileus mexicanus* (*Jacaratia mexicana* A. DC.), *Caiophora Jorgensenii*, *Gilbertia amplifolia*, *G. Smithiana*, *G. eurycarpa*, *G. alaris* (*Hedera alaris* C. & S.), *G. darienensis* (*Dendropanax darienense* Seem.), *Gilia chachanensis*, *Patima formicaria*, *Gnaphalium albidum*, *G. texanum*, *G. viridulum*.—(3) A neglected paper by JEAN LOUIS BERLANDIER. Attention is called to a brochure of 16 pages by Berlandier, recently discovered in the library of the Gray Herbarium. This pamphlet bears the title "Memorias de la Comision de limites a las ordenes del General Manual de Mier y Teran" and the date 1832. The paper consists of dual Latin and Spanish descriptions of newly proposed species and 4 new genera. The identification of the proposed genera and species has been facilitated by finding herbarium specimens labeled in Berlandier's handwriting with the published names as well as by comparison with a volume of unpublished plates by the same author. This discovery has lead to the following nomenclatorial transfers: *Hamatocactus bicolor* (*Cactus bicolor* Teran & Berl.), *Leucophyllum frutescens* (*Terania frutescens* Berl.), *Ehretia anacua* (*Gaza anacua* Teran & Berl.), *Mahonia tinctoria* (*Chrysodendron tinctoria* Terna & Berl.).—(4) On the validity of Molina's scientific names. The plant names proposed by MOLINA in the 1772 edition of the "Saggio sulla storia naturale del Chili" are considered valid and the following new transfers are made in order that the plant names involved will conform to the International Rules of Nomenclature: *Fitzroya cupressoides* (*Pinus cupressoides* Molina), *Frankenia salina* (*Ocimum salinum* Molina), *Gomortega keule* (*Lucuma keule* Molina), *Larrea balsamica* (*Mimosa balsamica* Molina), *Myrceugenia luma* (*Myrtus luma* Molina), *Nierembergia minima* (*Nicotiana minima* Molina), and *Statice guaicura* (*Plegorhiza guaicura* Molina).—E. B. Payson.

3940. JUMELLE, HENRI. Les *Dypsis*, palmiers de Madagascar. [The *Dypsis* palms of Madagascar.] Bull. Acad. Malgache N.S. 6: 1-20. 1922-1923.—*Dypsis* is a genus of palms peculiar to Madagascar, near to *Neophloga* and *Chrysalidocarpus*, but easily distinct in the staminate flowers which have only 3 stamens. This memoir gives new information concerning the morphology and distribution in the island of the species already known (*D. Hildebrandtii*, *D. Mocquerysiana*, *D. Lanceana*, *D. forficifolia*, *D. gracilis*, *D. glabrescens* and *D. hirtula*). The following new species are described: *D. manaranensis*, *D. procera*, *D. littoralis*, *D. angusta*, *D. viridis*, *D. linearis*, *D. plurisecta*, *D. monostachya*, *D. masoalensis*, *D. fasciculata*, *D. longipes* and *D. Louvelii*. All these new species are from the east of Madagascar. Among the old species, *D. Hildebrandtii* is from the east and center, *D. forficifolia* as well as *D. glabrescens* is from the east and from Sainte-Marie. *D. gracilis* is from the east, from Sainte-Marie and from Sambirano in the northwest. All the other species are from the east.—*Author*.

3941. MERRILL, ELMER D., AND H. ATHERTON LEE. A consideration of the species *Citrus maxima* (Burm.) Merrill. Amer. Jour. Bot. 11: 382-384. 2 fig. 1924.—The authors propose a new varietal name, *Citrus maxima* (Burm.) Merr. var. *wacarpa*, to include the West Indian grapefruits as distinguished from the East Indian pummelos or shaddocks.—*E. W. Sinnott*.

3942. MEUNISSIER, A. Le *Castanea vesca heterophylla* de Verrières. [The *C. vesca heterophylla* of Verrières.] Bull. Soc. Bot. France 70: 676-679. 1923.

3943. MUGNIER, LOUIS. Sépiacées à pédicelles glanduleux. [Sepiaceae (Rosaceae) with glandular pedicels.] Bull. Soc. Bot. France 70: 415-418. 1923.—The author considers this character in several species of *Rosa* and gives the description of *Rosa agrestis Vaccarii* R. Keller n. var.—*P. A. Young*.

3944. PARKER, R. N. Botanical notes on some plants of the Kali Valley. Indian Forest 50: 397-400. 1924.—A new species, *Leptodermis riparia*, is described. Distribution notes are given for *Stephania gracilentia* Miers., *Berberis Koehneana* C. K. Schn., *B. Joeschkeana* C. K. Schn., *B. Duthieana* C. K. Schn., and *Astragalus aegacanthoides* Parker.—*E. N. Munns*.

3945. PELLEGRIN, FRANÇOIS. Une nouvelle Légumineuse africaine qui terre ses fruits. [A new African legume which buries its fruit.] Bull. Soc. Bot. France 70: 491-493. 1923.—The author describes the new species, *Kerstingiella Tisserantii*, which buries its fruit when ripening. It is related to *Dolichos Baumannii* Harms.—*P. A. Young*.

3946. ROBINSON, B. L. Records preliminary to a general treatment of the Eupatorieae. IV. Contrib. Gray Herb. N. S. 73: 3-31. 1924.—A number of collections of tropical American *Eupatorieae* recently studied by the author have yielded the following new species, varieties and forms: *Ophryosporus apricus*, *O. Macbridei*, *Eupatorium beneolens*, *E. beneolens* f. *typicum*, *E. beneolens* f. *ctenotum*, *E. bullatissimum*, *E. caldense*, *E. Carletonii*, *E. Taunayanum* Glaziov., *E. desmophyllum*, *E. dichroum*, *E. eximium*, *E. hidroides*, *E. Hitchcockii*, *E. lithophilum*, *E. mesoreopolium*, *E. parvulum* Glaziov., *E. peninsulare* Brandegees var. *epipolimium*, *E. procerum*, *E. sphagnophilum*, *E. theaefolium* Benth. var. *typicum*, *E. theaefolium* Benth. var. *subellipticum*, *E. variolatum*, *Mikania aquaria*, *M. cryptodonta*, *M. decora* Poepp. var. *typica*, *M. decora* Poepp. var. *heteroneura*, *M. Gleasonii*, *M. nigropunctata* Hieron. var. *denticulifolia*, *M. hesperia*, *M. Hitchcockii*, *M. inornata*, *M. lasiopoda*, *M. Macbridei*, *M. montana*, *M. pastatae*, and *M. rivularis*. In addition to these novelties additional information is given concerning previously described plants.—*E. B. Payson*.

3947. RUPPERT, JOS. *Ophrys fuciflora* × *muscifera*. Bot. Archiv. 4: 405-412. 6 fig. 1923.—The author describes the following 4 forms of this species: f. *perfuciflora*, f. *integriflora*, f. *intermedia*, and f. *permuscifera*.—*William Seifriz*.

REVISIONS AND MONOGRAPHS

3948. BERGER, ALWIN. [Rev. of: BRITTON, N. L., AND J. N. ROSE. The Cactaceae: descriptions and illustrations of plants of the cactus family. Carnegie Inst. Washington Publ. 248. vol. 1, 1919; vol. 2, 1920; vol. 3, (see Bot. Absts. 12, Entry 4665) 1922; vol. 4, 1924. Science 60: 66-67. 1924. (See also Bot. Absts. 10, Entry 1400; 12, Entries 4667, 6690; this issue, Entry 3951.)

3949. BLAKE, S. F. Revision of the American species of *Rinorea*. Contrib. U. S. Nation. Herb. 20: 491-518. Pl. 31-37. 1924.—An introduction discussing the principal specific characters and the nomenclature and uses of the genus is followed by a key to the species. Thirty-seven species, with 2 additional ones of doubtful position, are given full systematic treatment. The paper closes with a list of doubtful and excluded species. New species and names are: *Rinorea crenata* (Costa Rica), *R. hymenosepala* (Columbia), *R. Martini* (Turcz.) Blake, *R. brachythrix* (Panama), *R. melanodonta* (Colombia, Venezuela), *R. brevipes* (Benth.) Blake, *R. deflexa* (Benth.) Blake, *R. ovalifolia* (Britton) Blake, *R. pubipes* (Costa Rica), *R. squamata* (Panama), *R. albicaulis* (Turcz.) Blake, *Amphirrox longiflora* (Oudem.) Blake. Seven species are illustrated by photographs.—S. F. Blake.

3950. BRACKETT, A. I. Revision of the American species of *Hypoxis*. II. Some genera closely related to *Hypoxis*. Contrib. Gray Herb. N.S. 69: 120-147. Fig. 1-13; 151-163. Fig. 14-17. 1923.—These papers are reprinted from *Rhodora* 25: 120-147. Fig. 1-13; 151-163. Fig. 14-17. 1923.—E. B. Payson.

3951. BROWN, N. E. The cactus family. [Rev. of: BRITTON, N. L., AND J. N. ROSE. The Cactaceae; descriptions and illustrations of plants of the cactus family. Vol. 4. vii + 318 p. 37 pl. Carnegie Inst. Washington Publ. 248. 1923.] *Nature* 114: 423-424. 1924.

3952. CAMUS, AIMÉE. Le genre *Aponogeton* L.f. [The genus *Aponogeton*.] Bull. Soc. Bot. France 70: 670-676. 1923.—The author gives a key to 26 recognized species of this genus, and also lists the species with their habitats.—P. A. Young.

3953. CAMUS, MLLÉ. A. Le genre *Iseilema* Anderss. [The genus *Iseilema*.] Bull. Soc. Bot. France 70: 493-495. 1923.—The author gives a key to the 6 recognized species in this genus. The following new combinations are included: *Iseilema prostrata* (*Andropogon prostratus* L.) and *I. membranacea* (*Anthistiria membranacea* Lindl.).—P. A. Young.

3954. DOP, PAUL. Contribution à l'étude du genre *Premna* L. [Contribution to the study of the genus *Premna* L.] Bull. Soc. Bot. France 70: 437-446; 829-836. 1923.—Following a discussion of this genus of the Verbenaceae, the author describes the following new species and varieties from Indo-China: *Premna cambodiana*, *P. Fortunati*, *P. yunnanensis*, *P. Balansae*, *P. Thorelii*, *P. tomentosa* Willd. vars. *Pierreana*, *pyramidata*, and *benghalensis*, *P. latifolia* Roxb. var. *glandulosa*, and *P. Chevalieri* and its var. *caudata*. A discussion of anatomical structure and distribution is given.—P. A. Young.

3955. GRANT, ADELE LEWIS. A monograph of the genus *Mimulus*. Ann. Missouri Bot. Gard. 11: 99-388. 1924.—In this monograph 114 species are recognized, the plants occurring throughout most of North America, the western coast of South America, southern Africa, Australia, and eastern Asia. Two subgenera are described for the first time, *Synplacus* with 4 sections and *Schizoplacus* with 5 sections. The sections, *Paradanthus* with 44 species, *Pseudoenoe* and *Tropanthus*, each with 1 species, are newly designated. The following species and varieties are described as new; *Mimulus arenarius*, *M. decurtatus*, *M. diffusus*, *M. discolor*, *M. Dudleyi*, *M. Grayi*, *M. Jepsonii*, *M. Johnstonii*, *M. Leibergii*, *M. purpureus*, *M. pygmaeus*, *M. stamineus*, *M. Whipplei*, *M. Bolanderi* Gray var. *brachydontus*, *M. floribundus* Dougl. var. *subulatus*, *M. longiflorus* (Nutt.) Grant var. *rutilus*, *M. primuloides* Benth. var. *linearifolius*, and *M. secundus* Gray var. *constrictus*, all from California; *M. ampliatius* from Washington and Idaho; *M. Bigelovii* Gray var. *cuspidatus* from California and Nevada; *M. densus* and *M. spissus* from Nevada; *M. guttatus* DC. var. *decorus* from Oregon; *M. Nelsonii*, *M. Treleasei*, *M. pachystylus* and *M. purpureus* Grant var. *pauciflorus* from Mexico; and *M. nepalensis* Benth. var. *procerus* from India. The following new combinations are offered: *M. angustifolius* (*Eunanus angustifolius* Greene), *M. aridus* (*Diplacus aridus* Abrams), *M. Austiniae* (*Eunanus Austiniae* Greene), *M. floribundus* Dougl. var. *geniculatus* (*M. geniculatus* Greene), *M. floribundus* Dougl. var. *membranaceus* (*M. membranaceus* A. Nels.), *M. glabratus* HBK. var. *Fremontii* (*M. Jamesii* T. & G. var. *Fremontii* Benth.), *M. glabratus* HBK. var. *parviflorus* (*M. parviflorus* Lindl.), *M. guttatus* DC. var. *arvensis* (*M. arvensis* Greene), *M. guttatus* DC. var. *depauperatus* (*M. luteus* L. var. *depauperatus* Gray), *M. guttatus* DC. var. *Hallii* (*M. Hallii* Greene), *M. guttatus* DC. var. *puberulus* (*M. puberulus* Greene), *M. longiflorus* (Nutt.) Grant var. *calycinus* (*Diplacus calycinus* Eastw.), *M. longiflorus* (Nutt.) Grant var. *linearis* (*M. linearis* Benth.), *M. nasutus* Greene var. *insignis*

(*M. guttatus* DC. var. *insignis* Greene), *M. nasutus* Greene var. *micranthus* (*M. micranthus* Heller), *M. parviflorus* (*Diplacus parviflorus* Greene), *M. pulchellus* (*Eumanus pulchellus* Drew), *M. ringens* L. var. *minthodes* (*M. minthodes* Greene), *M. stellatus* (*Diplacus stellatus* Kellogg), *M. subsecundus* Gray var. *viscidus* (*M. viscidus* Congdon), *M. Tilingii* Regel var. *caespitosus* (*M. caespitosus* Greene), *M. Tilingii* Regel var. *corallinus* (*M. corallinus* Greene). *M. crinitus* is given as a new name.—Author.

3956. HITCHCOCK, A. S. The North American species of *Aristida*. Contrib. U. S. Nation. Herb. 22: 517-586. 1924.—Sixty species are recognized, 7 of which are new. The short introduction is followed by the description and synonymy of the genus, with a key to the 38 sections recognized and under each a key to the included species. Full descriptions, with synonymy and lists of exsiccatae, are given under each species. The paper is completed by lists of doubtful and excluded species, and of new names. The following new names occur: *Aristida peninsularis* (Lower California), *A. glabrata* (Vasey) Hitchc., Section *Uniseta*, *A. ternipes* Cav. *divergens* (Vasey) Hitchc., *A. Eggersii* (Cuba), *A. longiseta* Steud. *rariflora* (Texas to Arizona and Colorado), *A. Scribneriana* (*A. lanuginosa* Scribn., not Clarion), *A. neglecta* Léon, *A. Chaseae* (Porto Rico), *A. tenuispica* (Florida), *A. Brittonorum* (Cuba), and *A. Rosei* (Hispaniola).—S. F. Blake.

3957. JOHNSTON, I[VAN] M. Studies in the Boraginaceae.—II. Contrib. Gray Herb. N. S. 70: 3-61. 1924.—(1) A synopsis of the American native and immigrant borages of the subfamily Boraginoideae. A key is given to the recognized genera of this subfamily known to occur in North, Central or South America: namely, to *Borago*, *Nonea*, *Symphytum*, *Lycopsis*, *Anchusa*, *Echium*, *Moritzia*, *Thaumatocaryon*, *Macromeria*, *Lasiarrhenum*, *Onosmodium*, *Lithospermum*, *Antiphytum*, *Mimophytum*, *Cynoglossum*, *Pectocarya*, *Omphalodes*, *Harpagonella*, *Myosotis*, *Cerinth*, *Asperugo*, *Amsinckia*, *Selkirkia*, *Cryptantha*, *Oreocarya*, *Plagiobothrys*, *Mertensia*, *Trigonotis*, *Lappula*, *Eritrichium*, and *Hackelia*. Except in the genera *Antiphytum*, *Amsinckia*, *Cryptantha*, *Oreocarya*, *Mertensia*, and *Hackelia*, a key is given to the species whenever more than one species is recognized. The generic and specific synonymy is extensive and the known range is indicated by the mention of States in Mexico and the rest of North America or by countries in Central and South America. The following new transfers, new species, new varieties, and new genera are published: *Thaumatocaryon tetraquetrum* (*Anchusa tetraquetra* Cham.), *T. dasyanthum* (*Anchusa dasyantha* Cham.), *T. Sellowianum* (*Anchusa Sellowiana* Cham.), *Lasiarrhenum* n. gen., *L. strigosum* (*Onosma strigosum* HBK.), *Onosmodium molle* Michx. var. *occidentale* (*O. occidentale* Mack.), *Lithospermum Pringlei*, *L. lasiosiphon*, *L. hypoleucum*, *L. calcicola* Rob. var. *Conzattii* (*L. Conzattii* Greenm.), *L. obtusifolium*, *L. Seleri*, *L. mediale*, *L. calycosum* (*L. strictum* var. *calycosum* Macbr.), *Pectocarya anomala*, *P. gracilis* (*Myosotis gracilis* R. & P.), *P. gracilis* var. *platycarpa* Munz & Johnston, *P. gracilis* var. *boliviana*, *P. gracilis* var. *dimorpha*, *P. penicillata* var. *genuina*, *P. penicillata* var. *heterocarpa*, *P. setosa* Gray var. *genuina*, *P. setosa* var. *aptera*, *P. setosa* var. *holoptera*, *Lappula texana* var. *genuina*, *L. texana* var. *columbiana* (*L. columbiana* A. Nels.), *L. texana* var. *foliosa* (*L. desertorum* var. *foliosa* A. Nels.), *Eritrichium elongatum* var. *argenteum* (*E. argenteum* Wight), *Euploca albiflora* (*Batschia albiflora* Raf.).—(2) A tentative classification of the South American *Coldenias*. A key is given to the 4 sections recognized. One of these *Sphaerocarya* is proposed as a new section. Eight species of *Coldenia* are recognized and a key is provided for distinguishing them. Synonyms and specific discussions are given.—E. B. Payson.

3958. JOHNSTON, IVAN M. Studies in the Boraginaceae.—III. Contrib. Gray Herb. N. S. 73: 42-78. 1924.—(1) The Old World genera of the Boraginoideae. The genera of this subfamily found in the Old World are placed in the following tribes: *Lithospermeae* (17 genera), *Anchuseae* (12 genera), *Eritrichieae* (19 genera), *Cynoglosseae* (12 genera). The tribes are characterized and a key is provided for the genera recognized as belonging to each. The following new specific combinations are made in the *Lithospermeae*: *Arnebia euchroma* (*Lithospermum euchromon* Royle), *Echiochilon somalense* (*Lobostemon somalensis* Franch.), *E. cryptocephalum* (*Lobostemon cryptocephalum* Baker), *E. lithospermoides* (*Leurocline lithospermoides* S. Moore), *E. Chazaliei* (*Lithospermum Chazaliei* Boissieu). The following transfers are made to *Echium* from *Lobostemon*: *Echium acutissimum* (*Lobostemon acutissimum* Buek), *E. Buekii* (*L. elongatus* Buek), *E. capitiforme* (*L. capitiformis* DC.), *E. cephaloideum*

(*L. cephaloideus* DC.), *E. cinereum* (*L. cinereus* DC.), *E. curvifolium* (*L. curvifolius* Buek), *E. diversifolium* (*L. diversifolius* Buek), *E. echioides* (*L. echioides* Lehm.), *E. fastigiatum* (*L. fastigiatus* Buek), *E. Galpinii* (*L. Galpinii* Wright), *E. microphyllum* (*L. microphyllus* Buek), *E. nitidum* (*L. nitidus* Bolus), *E. obovatum* (*L. obovatus* DC.), *E. obtusifolium* (*L. obtusifolius* DC.), *E. oederiaefolium* (*L. oederiaefolius* DC.), *E. paniculaeforme* (*L. paniculaeformis* DC.), *E. pilicaule* (*L. pilicaulis* Wright), *E. pubiflorum* (*L. pubiflorus* Wright), *E. sanguineum* (*L. sanguineus* Schlechter), *E. Schlechteri* (*L. collinus* Schlechter, not Salisb.), *E. stachydeum* (*L. stachydeus* DC.), *E. virgatum* (*L. virgatus* Beuk), *E. Wurmii* (*L. Wurmii* DC.). In the *Anchuseae* the following new combinations are given: *Trigonocaryum involucreatum* (*Myosotis involucreata* Stev.), *Brunnera macrophylla* (*Myosotis macrophylla* Marschall), *B. orientalis* (*Myosotis orientalis* Schenk), *Anchusa humilis* (*Echium humile* Desf.), *Lithodora consobrina* (*Lithospermum consobrinum* Pomel), *L. diffusa* (*Lithospermum diffusum* Lag.), *L. rosmarinifolia* (*Lithospermum rosmarinifolium* Ten.), *L. Zahnii* (*Lithospermum Zahnii* Heldr.), *Elizaldia violacea* (*Echioides violacea* Desf.), *E. phanerantha* (*Nonnea phanerantha* Viv.), *E. heterostemon* (*Nonnea heterostemon* Murb.). In the *Eritrichieae* the following new specific combinations and new genera are published: *Microula myosotidea* (*Schistocaryum myosotideum* Franch.), *M. ciliaris* (*Schistocaryum ciliare* Bur. & Franch.), *M. ovalifolia* (*Schistocaryum ovalifolium* Bur. & Franch.), *Microcaryum* n. gen., *M. pygmaeum* (*Eritrichium pygmaeum* Clarke), *Amblynotus* n. gen., *A. obovatus* (*Eritrichium obovatum* A. DC.), *Rochelia pluriseipalea* (*Maccoya pluriseipalea* F. Muell.), *Oreogenia* n. gen., *O. Munroi* (*Eritrichium Munroi* Clarke), *Chionocharis* n. gen., *C. Hookeri* (*Myosotis Hookeri* Clarke), *Plagiobothrys asiaticus* (*Allocarya asiatica* Kom.), *P. borneensis* (*Havilandia borneensis* Stapf), *P. minutus* (*Lithospermum minutum* Wernh.), *P. (?) Zollingeri* (*Lithospermum Zollingeri* A. DC.). The following new combinations are made in the *Cynoglosseae*: *Caccinia monandra* (*Heliocarya monandra* Bunge), *Cynoglossum Thomsoni* (*Paracaryum Thomsoni* Clarke).—(2) Notes on miscellaneous American Boraginaceae. A key is given to the 5 known species of *Cryptantha* from Peru. The following new species, new combinations and new variety occur: *Cryptantha latifolia*, *C. Macbridei*, *C. peruviana*, *Amsinckia hispida* (*Lithospermum hispidum* R. & P.), and *Harpagonella Palmeri* var. *arizonica*.—E. B. Payson.

3959. LITARDIÈRE, R. DE. Revision du groupe *Festuca ovina* L. subsp. *alpina* Hack. Bull. Soc. Bot. France 70: 287-293. Fig. 1-8. 1923.—Following a key to the varieties, the author gives descriptions of the following: *Festuca ovina* L. var. *Briquetii* St-Y. subvar. *eubriquetii* St-Y. & R. Lit. n. name, *F. ovina* subvar. *dyris* (Maire & Trab.) St-Y. & R. Lit. n. comb., and *F. ovina* subvar. *Gaucheri* St-Y. & R. Lit. n. subvar.—P. A. Young.

3960. MUNZ, PHILIP A. A revision of the genus *Nemacladus* (Campanulaceae). Amer. Jour. Bot. 11: 233-248. Pl. 9-10. 1924.—The genus as a whole is discussed and the characters by which it can be distinguished from the closely related *Baclea* and *Parishella* are described. Ten species have been described in this genus, which the author reduces to 3: *N. longiflorus* Gray; *N. ramosissimus* Nutt.; *N. ramosissimus* var. *pinnatifidus* (Greene) Gray; *N. ramosissimus* var. *gracilis* (Eastw.) n. comb.; *N. rigidus* Curran; *N. rigidus* var. *australis* n. var.; *N. rigidus* var. *montanus* (Greene) n. comb.; *N. rigidus* var. *interior* n. var.; *N. rigidus* var. *capillaris* (Greene) n. comb.; and *N. rigidus* var. *rubescens* (Greene) n. comb.—E. W. Sinnott.

3961. PENLAND, C. WILLIAM. Notes on North American Scutellarias. Contrib. Gray Herb. N.S. 71: 61-79. Pl. 140-141. 1924.—This paper is reprinted from *Rhodora* 26: 61-79. Pl. 140-141. 1924.—E. B. Payson.

3962. PENNELL, FRANCIS W. Scrophulariaceae of Cuba. Proc. Acad. Nat. Sci. Philadelphia 75: 1-21. 1923.—Forty species of which 22 are endemic to Cuba are listed. The distribution of Scrophulariaceae in North and South America as related to the Cuban forms is discussed as well as the distribution in Cuba. The following new combinations and new names are made: *Macuillamia repens* (*Gratiola repens* Sw.), *Bramia micromonnièria* (*Hemipetis micromonnièria* Griseb.), *Caconapea sessiliflora* (*H. sessiliflora* Benth.), *C. beccabunga* (*H. beccabunga* Griseb.), *Lendneria ageratifolia* (*Stemodia ageratifolia* Wright), *Hemianthus tetrandrus* (*Micramthemum tetrandrum* Wright), and *Scrophularia minutiflora* (*S. micrantha* Desv., not Urville).—L. B. Walker.

3963. RYDBERG, P. A. **Genera of North American Fabaceae II. Tribe Galegeae** (Continued). Amer. Jour. Bot. 11: 470-482. Pl. 33-36. 1924.—The following subtribes are considered: Subtribe 6 *Diphysanae* (including *Diphysa*); Subtribe 7 *Corynellanae* (including *Sabinea*, *Corynella*, *Notodon*, *Bembicidium*); Subtribe 8 *Robinianae* (including *Robinia*, *Ostrya*, *Coursetia*, *Lennea*, *Willardia*, *Hesperothamnus*, *Hebestigma*, *Gliricidia*, *Sauvallella*, *Poitea*, *Benthamantha* and *Sphinctospermum*. *Sauvallella* is a new genus, the type species of which is *S. immarginata* (*Corynella immarginata* Wright).—E. W. Sinnott.

3964. WEINGERL, HERMANN. Beiträge zu einer Monographie der europäisch-asiatischen Arten aus der Gattung *Draba*, sect. *Leucodraba*. [The European-Asiatic species of *Draba*.] Bot. Archiv. 4: 9-109. 5 pl., fig. 1-15. 1923.—The author discusses the taxonomy, anatomical features and phylogeny of *Draba* (Cruciferae), especially the sect. *Leucodraba*. An extensive bibliography is given.—William Seifriz.

FLORISTICS AND PLANT DISTRIBUTION

3965. ANONYMOUS. An unusual specimen of *Trichopilia coccinea*. Missouri Bot. Gard. Bull. 12: 91-92. Pl. 25. 1924.

3966. ARÈNES, J. Contribution à la flore de Provence. [Contribution to the flora of Provence.] Bull. Soc. Bot. France 70: 509-517. 1923.—The author gives a long list of plants found in this region.—P. A. Young.

3967. ARÈNES, J. Notes sur la flore parisienne. [Notes on the flora of Paris.] Bull. Soc. Bot. France 70: 623-628. 1923.—The author gives a key to the French species and varieties of *Salsola*. He describes: *Veronica Chamaedrys* L. var. *brevipes* n. var. and *Salsola Tragus* L. var. *pseudo-Tragus* n. var.—P. A. Young.

3968. BRUN, PIERRE LE. Une Graminée nouvelle pour la flore française et quelques localités inédites de plantes peu communes pour le Sud-Est de la France. [A new French grass and some unpublished localities for some uncommon plants.] Bull. Soc. Bot. France 70: 661-665. 1923.—The grass, new to France, is *Sesleria microcephala* DC.—P. A. Young.

3969. BUROLLET, P. A. Observations sur la Mercuriale annuelle. [Observations on the annual *Mercurialis*.] Bull. Soc. Bot. France 70: 250-254. Fig. 1-9. 1923.

3970. BUROLLET, P. A. Sur quelques géophytes du Sahel de Sousse. [Some geophytes of the Sahel of Sousse.] Bull. Soc. Bot. France 70: 6-12. 1923.—The author gives a list and discussion of the bulbous plants collected in the Sahel of Sousse.—P. A. Young.

3971. CHAPAIS, J.-C. Airelles et Myrtilles. [Blueberries and huckleberries.] Nat. Canadien 50: 268-270. 1924.—Popular comments are given on the differences between the huckleberry and blueberry species in Quebec.—A. H. MacKay.

3972. CHEVALIER, AUG. Note sur les *Spartina* de la flore française. [Note on the species of *Spartina* in the French flora.] Bull. Soc. Bot. France 70: 54-63. 3 fig. 1923.—The author gives chief consideration to 4 old species.—P. A. Young.

3973. CHEVALIER, AUG. Rapports entre la végétation de la Normandie et du Massif Breton et celle de la Grande-Bretagne. [Affinities of the vegetation of Normandy and Brittany with that of Great Britain.] Bull. Soc. Bot. France 70: 598-623. 1923.—A discussion of the flora of the different regions is followed by a long list of species found in the different places.—P. A. Young.

3974. DEAM, CHAS. C. Shrubs of Indiana. Dept. Conserv. State Indiana Publ. 44. P. 1-351. Pl. 1-148. 1924.—The author recognizes 143 native species and several varieties. Each species is described botanically and scientific and common names are given. The general distribution of each species is indicated and also the distribution in Indiana. The nomenclature is that of the International Code and the sequence of families is that of the 7th edition of Gray's Manual. The Indiana distribution is based primarily on specimens in the author's herbarium, which have been gathered over a period of 28 years, involving over 50,000 miles of travel. Each species is illustrated by a photographic reproduction from specimens in the author's herbarium. Two endemic varieties are found in the state: *Viburnum pubescens* var. *Deamii* Rehder and *Viburnum pubescens* var. *indianense* Rehder. The division on *Salicaceae* was contributed by C. R. BALL; the foreword, by STANLEY COULTER.—T. G. Yuncker.

3975. FOURNIER, P. Deux Composées adventices: *Telekia speciosa* (Schreb.) Baumg. et *Bidens connatus* Mühlenberg. [Two adventitious composites: *T. speciosa* and *B. connatus*.] Bull. Soc. Bot. France 70: 823-826. 1923.—The distribution of these species is considered.—P. A. Young.

3976. FOURNIER, P. Espèces et variétés nouvellement reconnues dans les Haute-Marne. [New species and varieties recognized in the Upper Marne.] Bull. Soc. Bot. France 70: 84-95. 1923.—Many flowering plants are listed with brief discussions. None are described as new species or varieties.—P. A. Young.

3977. FREEDLEY, ANNA B. Some interesting trees of Honolulu. Gard. Chron. America 28: 46-49. Photo. Illus. 1924.—Among the species are *Acacia Koa*, *Metrosideros polymorpha*, *Pithecolobium samang*, *Ansonia digitata*, *Agathis australis*, *Aleurites moluccana*, *Hibiscus tiliaceus*, *Tamarindus indica*, *Ficus bengalensis*, *Oreodoxa regia*, *Cocos nucifera*, *Cycas circinalis*, *Samanea samam*, *Mangifera indica*, *Delonix regia*, *Cassia fistula*, and *Cassia nodosa*.—A. C. Beal.

3978. GANDOGGER, MICHEL. L'*Anemone albida* Mariz nouveau pour la France et le genre *Anemone*. [*Anemone albida* Mariz new in France; discussion of the genus *Anemone*.] Bull. Soc. Bot. France 70: 28-30. 1923.

3979. GANDOGGER, MICHEL. Mon 24^e et dernier voyage en Espagne et en Portugal. [My 24th and last voyage in Spain and Portugal.] Bull. Soc. Bot. France 70: 446-451. 1923.—The author describes his trip and lists some of the plants that he saw.—P. A. Young.

3980. GANDOGGER, MICHEL. Plantes de Chine du R. P. Chanet, 2^e série. [Chinese plants of R. P. Chanet; 2nd series.] Bull. Soc. Bot. France 70: 826-829. 1923.—This is a long list of plants, chiefly phanerogams.—P. A. Young.

3981. GERBAULT, E. L. Contribution à la connaissance du *Viola meduanensis* de Boreau. [Contribution to the knowledge of *V. meduanensis* de B.] Bull. Soc. Bot. France 70: 46-54. 1923.—The author gives a long discussion of this species.—P. A. Young.

3982. GUFFROY, CH. La flore agricole de la France: I. Les "mauvaises herbes" des terres cultivées. II. Les plantes des prairies et des pâturages. [The agricultural flora of France. I. Bad weeds of cultivated land. II. Prairie and pasture plants.] Bull. Soc. Bot. France 70: 79-84. 1923.—This article consists of a brief review of a long paper on the agricultural flora of France, which the author hopes to publish later. He gives the families in which the plants occur and the percentages of extant species in some of the main families.—P. A. Young.

3983. GUFFROY, CH. Notes sur la flore ardéchoise. [Notes on the flora of Ardèche.] Bull. Soc. Bot. France 70: 12-27. 1923.—The author lists and discusses the flowering plants and fungi collected near Ardèche in the Cevennes Mountains.—P. A. Young.

3984. LINDINGER, LEONHARD. Vorläufige Mitteilung über einige Ergebnisse meiner Zweiten Kanarenreise. [Notes on a second Canary Island trip.] Bot. Archiv. 4: 263-277. 1923.—The author lists and in part describes and gives the distribution of many species of plants of the Canary Islands, with special reference to the dragon tree *Dracaena*.—William Seifriz.

3985. LITARDIÈRE, R. DE. Quelques plantes recueillies en Corse par M. Aylies. [Some plants collected in Corse by Aylies.] Bull. Soc. Bot. France 70: 817-823. 1923.

3986. MARIE-VICTORIN, FR. Note sur un arbre nouveau du Quebec: Le *Crataegus Victorinii* Sargent. [Note on a new tree of Quebec, *Crataegus Victorinii* Sargent.] Nat. Canadien 50: 21-23. 1923.—The species is described by SARGENT in Jour. Arnold Arboretum 3: 203, 1922; and the discoverer adds notes on its range and character and states that the species is remarkably distinct for a late flowering hawthorn.—A. H. MacKay.

3987. MARNAC, EMILE, ET ALFRED REYNIER. Nouvelles contributions à la flore du département du Var. [New contributions to the flora of the Department of Var.] Bull. Soc. Bot. France 70: 34-46, 95-105, 215-221. 1923.—The authors give a discussion of the flora and a long list of species collected.—P. A. Young.

3988. MOREAU, FERNAND, ET MME. F. MOREAU. Les éléments de la détermination des sortes chez le Houblon cultivé. [The elements in the determination of forms in cultivated hops.] Bull. Soc. Bot. France 70: 455-466. Pl. 5-6, fig. 1-4. 1923.

3989. MOREAU, FERNAND, ET MME. F. MOREAU. Essai de reconstitution de la phylogénée des Houblons de l'Est de la France. [Essay on the reconstitution of the phylogeny of the hops of eastern France.] Bull. Soc. Bot. France 70: 636-644. 1923.—A detailed discussion of the phylogeny and distribution of the hops in eastern France is given.—P. A. Young.

3990. MOREAU, FERNAND, ET MME. F. MOREAU. Essai de filiation des Houblons de Bourgogne. [Essay on the relationships of hops from Bourgogne.] Bull. Soc. Bot. France 70: 726-731. 1923.—The article contains a detailed discussion of the different kinds of hops.—P. A. Young.

3991. NICOLAS, G. Remarques sur la présence aux environs de Toulouse de quelques plantes étrangères. [Some foreign plants in the vicinity of Toulouse.] Bull. Soc. Hist. Nat. Toulouse 50: 113-116. 1922.—Notes are given on 3 species, *Lepidium virginicum* L., *L. perfoliatum* L., and *Senebiera didyma* Pers., which are introduced with grains and which do not spread readily or may even disappear; and on 1 species, *Heleocharis amphibia* Durieu, which is localized in the vicinity where it was introduced. A description of the latter from Beille is given. The author bases the sudden appearance and disappearance of the 2 species of *Lepidium* on the possession by the seed of a mucilaginous epidermis which absorbs the smallest amounts of water available, favoring germination, and thus allowing these plants to grow in railroad ballast, gravel, and other places too dry for the germination of most species. The dryness of the situation, however, is often responsible for the disappearance of the species after germination because of the lack of sufficient moisture for further growth. Similar conditions are factors in the distribution of some nettles.—Neil Hotchkiss.

3992. OFFNER, JULES. Observations sur la flore des Alpes du Dauphiné. [The flora of the Dauphine Alps.] Bull. Soc. Bot. France 70: 471-480, 679-689. 1923.—The author gives a general discussion followed by a list of flowering plants with notes on each.—P. A. Young.

3993. PEARSALL, W. H., AND F. A. MASON. Yorkshire naturalists at Scarthingwell Park and in Teesdale. Naturalist 1924: 343-350. 1924.—Reports of 2 field meetings are given.—W. H. Burrell.

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

SAM F. TRELEASE, Editor

3994. ANONYMOUS. Plans for the New York Botanical Garden. Science 60: 561. 1924.

3995. ANONYMOUS. Science and the British Empire. [Rev. of: The resources of the Empire series. Vol. 1. AINSWORTH-DAVIS, J. R. Pt. 1. Crops and fruits. 144 p. Pt. 2. Meat, fish and dairy produce. 104 p. Vol. 2. DULY, J. S., Editor, Timber and timber products: including paper making materials. 228 p. Vol. 3. WARD, J. S. M. Textile fibers and yarns. 192 p. Vol. 5. MACLAREN, W. A. Rubber, tea and cacao; with special sections on coffee, spices and tobacco. 334 p. Vol. 6. SNOW, E. C. Leather, hides, skin and tanning materials. 368 p. Ernest Benn, Ltd.; London, 1924.] Nature 114: 526-530. 1924.

3996. AMBLER, JOSEPH A., AND WALTER C. HOLMES. The investigation of biological stains in the color laboratory of the bureau of chemistry. Science 60: 501-502. 1924.

3997. DOP, PAUL. Sur l'emploi de la chrysoïdine en histologie végétale. [Use of chrysoïdine in plant histology.] Bull. Soc. Hist. Nat. Toulouse 50: 90-92. 1922.—Staining successfully with chrysoidine and a cellulose colorant, such as Delafield's haematoxylin or Meyer's Haem-Alum, gives a stable and well-differentiated preparation as a substitute for acetate iodine green and ammoniacal congo red. Difficulty in procuring iodine green led to experimentation with this combination.—Neil Hotchkiss.

3998. ENDERT, F. H. Zwavel als goedkoop conserveeringsmiddel voor herbarium. [Sulphur, a cheap preservative for an herbarium.] (With a summary in English.) Tectona 15: 890-893. 1922.—In the tropics a solution of corrosive sublimate in alcohol is generally used for the preservation of an herbarium, but this preservative is expensive and poisonous. About 6 years ago the writer merely sprinkled powdered sulphur on a well-dried collection. The collection has not been attacked by insects or molds, notwithstanding the moist tropical climate in which it has been kept.—Charles Coster.

3999. GÉNAT, E. *Un nouveau microtome d'étude.* [A new microtome.] Bull. Soc. Bot. France 69: 741-742. 1 fig. 1922.—A very simple form of a sliding microtome is described.—P. A. Young.

4000. HENRY, AUGUSTINE. *Manna of larch and of douglas fir, melezitose and lethal honey.* Pharm. Jour. 112: 387-390. Fig. 2. 1924.—Melezitose, a rare and expensive sugar used as a culture medium in the discrimination of pathogenic bacteria, has not been prepared artificially. It occurs in nature in mannas of larch, douglas fir, and *Alhagi camelorum*, and in the honeydews of lime and poplar trees. It is the potent constituent of deleterious honey sometimes gathered by bees from the honeydew of pine trees. Larch manna is not commonly found, and specimens in European museums are rare. It was formerly supposed to occur only in the forests of the French Alps around Briançon, but in 1919 it was discovered in a number of places in the Swiss Alps. It has been stated that this manna is formed on the larches only for a few days about the first of July and from odd trees growing on hot, sunny slopes at high elevations. It was found in Switzerland during a hot, very dry summer and at elevations of 4-6 thousand feet. The manna was in white, flaky masses encrusting younger branches, the tears being 1-2 cm. in diameter and 3-4 cm. in length, smooth on the surface, readily powdered by the fingers, and usually dissolving in the saliva with an agreeable, sweet taste. In a number of places, the rocks beneath the trees were covered with the manna. Entomological investigation indicates that this manna is really a honeydew which has been rapidly dried by the dry, hot atmosphere. The aphids, probably *Lachnus laricis*, sucks the sap out of the larch's foliage and voids the honeydew which is really the undigested residue of the carbohydrates contained in the sap. Other investigators claim, however, that the manna found on douglas fir arises from a direct exudation from the tips of the leaves. Douglas fir manna, which is very similar to the larch manna, contains 75-83% of melezitose, while the manna from the Arabian shrub, *Alhagi camelorum*, contains 20-38% of melezitose. Somewhat similar mannas have also been gathered from the Cedars of Lebanon, the Western Larch (*Larix occidentalis*), 2 Himalayan pines (*Pinus excelsa* and *P. longifolia*), poplar and lime trees.—E. N. Gathercoal.

4001. KOEHLER, ARTHUR. *Suggested modifications of the celloidin method.* Science 60: 525. 1924.—In place of the iron pipe pressure tank suggested by LODGEWICK (Science 60: 67. 1924) a heavy glass jar may be used. Woody material may be properly imbedded in only 1 solution (10%) provided a liberal supply is present. Alternate heating and cooling hastens the process.—C. J. Lyon.

